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50th

Past Triumphs & Future Horizons

TRANSCON 2025



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TRANSCON 2025

50th Annual National Conference of The Indian Society of Blood Transfusion and Immunohaematology

Souvenir & Abstract Book

19th–21st September 2025



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Messages

नायब सिंह
NAYAB SINGH



मुख्य मन्त्री, हरियाणा,
चण्डीगढ़।

CHIEF MINISTER, HARYANA,
CHANDIGARH

Dated 02-09-2025

Message

I am delighted to know that the Indian Society of Blood Transfusion & Immunohaematology (ISBTI) is organizing the 50th TRANSCON - Golden Jubilee Annual National Congress from 19th to 21st September 2025 in Delhi NCR.

Haryana has always encouraged initiatives that contribute to the well-being of people, and I am happy that this prestigious congress is being hosted in the region. Over the last five decades, TRANSCON has brought together experts, researchers and practitioners in transfusion medicine and immunohaematology, playing a significant role in advancing knowledge and strengthening blood transfusion services in India.

The Golden Jubilee edition is both a celebration of past achievements and a step forward towards future progress. I am confident that the deliberations at this landmark event will open new avenues of collaboration, inspire innovation and further enhance healthcare delivery in our country.

I extend my heartiest congratulations and best wishes to ISBTI, the organizing team, and all participants for the success of TRANSCON 2025.

(Nayab Singh)

Dr. Arvind Kumar Sharma
डॉ. अरविंद कुमार शर्मा

Co-operation, Jails, Election, Heritage & Tourism Minister, Haryana, Chandigarh
सहकारिता, कारागार, निर्वाचन विरासत एवं पर्यटन मंत्री हरियाणा, चंडीगढ़

Message



It gives me immense pleasure to know that the Indian Society of Blood Transfusion & Immunohematology (ISBTI) is organizing the 50th TRANSCON - Golden Jubilee Annual National Congress from 19th to 21st September 2025 in Delhi NCR.

ISBTI's dedication to promoting voluntary blood donation, scientific exchange, and ethical practices has been a beacon of excellence for voluntary blood donation, advancing scientific knowledge, and improving access to safe and reliable blood services.

The Golden Jubilee Congress is a testament to their enduring impact and visionary leadership in the field and TRANSCON 2025 is a landmark event that blends celebration with purpose—honoring ISBTI's legacy while driving forward the science, ethics, and community engagement essential to modern blood transfusion practices. It's where history meets innovation, and collaboration fuels progress.

I extend my warmth congratulations and heartiest wishes to every individual, participant, faculty members, organizers, delegates, and Chief Patron and members of organizing committee for accomplishment of aim of this landmark event. May this congress be a powerful catalyst for new innovations, collaborations and continued progress in future.

(Dr. Arvind Sharma)

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अनुप्रिया पटेल
ANUPRIYA PATEL

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भारत सरकार

MINISTER OF STATE
HEALTH & FAMILY WELFARE
AND CHEMICALS & FERTILISERS
GOVERNMENT OF INDIA

Message



I am glad to know that the **Indian Society of Blood Transfusion & Immunohaematology (ISBTI)** is organizing the **50th TRANSCON - Golden Jubilee Annual National Congress** from 19th to 21st September 2025 in Delhi NCR.

ISBTI has been at the forefront of strengthening transfusion medicine in India through its tireless efforts in promoting voluntary blood donation, advancing scientific knowledge, and improving access to safe and reliable blood services. TRANSCON has, over the years, become a respected platform for experts and professionals to share ideas, experiences and innovations that benefit patients and society at large.

The Golden Jubilee celebration is a proud milestone and an opportunity to reaffirm our collective resolve to further improve healthcare delivery in this important field. I am confident that the deliberations at TRANSCON 2025 will lead to meaningful insights and constructive collaborations.

I extend my warm wishes to the organizers, delegates, and faculty members for the success of this landmark event.

(Anupriya Patel)

September 5, 2025
New Delhi.

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Dear Delegates,

I feel privileged to extend a warm welcome to all esteemed delegates, respected faculty, and distinguished guests gathered here for the 50th TRANSCON – the Golden Jubilee Annual National Congress of the Indian Society of Blood Transfusion & Immunohaematology (ISBTI).

For five decades, TRANSCON has stood as a beacon of knowledge, innovation, and collaboration in the fields of transfusion medicine and immunohaematology. The Conference has consistently provided a platform for experts, clinicians, researchers, and educators to exchange ideas that not only strengthen our scientific understanding but also translate into better outcomes for patients, which remains the true measure of progress in healthcare.

As we celebrate this historic Golden Jubilee edition, we acknowledge the unwavering commitment of ISBTI in raising the standards of transfusion medicine in India. Its pioneering role has contributed significantly to improving access, safety, and quality in this vital area of medicine, and in doing so, has strengthened the very fabric of our healthcare ecosystem.

At Max Healthcare, we firmly believe that the future of Indian healthcare lies in combining clinical excellence with innovation, collaboration, and a steadfast commitment to patient-centricity. As we look ahead, forums such as TRANSCON will be instrumental in driving this vision forward — sparking new ideas, fostering invaluable collaborations, and paving the way for transformative solutions that can benefit not only India but also the global healthcare community.

I convey my heartfelt congratulations to ISBTI and the organising team for their tireless efforts in convening this Golden Jubilee Congress. To all participants and delegates, I wish you three days of insightful discussions, enriching exchanges, and meaningful collaborations. May this historic occasion inspire us all to push boundaries, set new benchmarks, and contribute to a healthier and stronger India.

With best regards and warm wishes,

ABHAY SOI
Chairman & Managing Director, Max Healthcare Institute Limited
Chief Patron - TRANSCON 2025



Dr. Yudhbir Singh, IAS
President
Indian Society of Blood Transfusion & Immunohaematology (ISBTI)

It gives me immense pleasure to Greet and Welcome everyone to Golden Jubilee Celebrations of 50th TRANSCON 2025 – The Annual Conference of Indian Society of Blood Transfusion & Immunohaematology (ISBTI) being held in the city of Delhi-NCR. Transcon happens to be the most important event of every year for everyone – blood donors, motivators, camp organizers, blood transfusion specialists, technicians, clinicians and the paramedical staff associated with blood transfusion services.

The theme of the conference this year is:
"Swarnjyanti Transcon: Past Triumphs & Future Horizons,"

This year's theme beautifully encapsulates our journey over the last five decades. As we celebrate our past achievements, we also look forward to the endless possibilities that lie ahead in the ever-evolving field of blood transfusion and immunohaematology.

This commemorative event serves as an opportunity not only to reflect on our significant milestones but also to engage in meaningful discussions that will influence the direction or future of our field. The event is aimed at enhancing the Safe Blood Transfusion Services, Voluntary Blood Donation Awareness Programs and Yogic Way of Life to achieve 100% voluntary blood donation in India.

I congratulate all the members of the Organizing Committee for their commitment and dedication to make the conference memorable and successful. The team is striving hard and doing its best to make sure that every aspect of conference achieves excellence.

The annual conference will provide great opportunity to all the delegates, participants, and other stake holders to interact with each other. It is going to be a great learning experience for life.
I would like to offer my best wishes for grand success of the conference.



Dr. Yudhbir Singh



Dr. Sangeeta Pathak
Organising Chairperson-TRANSCON 2025
Secretary General-ISBTI
Director & Head Transfusion Medicine Max Healthcare

On behalf of ISBTI, and as your Organising Chairperson for this Golden Jubilee Conference of Indian Society of Blood transfusion & Immunohematology (ISBTI), Transcon 2025, from 19th-21st September 2025 in Delhi, NCR, I extend my warmest welcome and sincere gratitude for your presence at this momentous occasion.

This Golden Jubilee Conference represents not just a celebration of the past, but a profound affirmation of our commitment to the future. Over these five decades, we have witnessed remarkable advancements in our understanding of blood groups, immune responses, and the intricacies of blood component therapy. The theme for this Conference **"Swaranjyanti Transcon: Past Triumphs & Future horizons,** says all about achievements, milestones & victories so far as well as nurturing innovation & aspirations yet to be explored.

Our journey of Transcon 2025 is not just of 3 days of the physical presence in the conference it was collaborating & engaging all experts for the whole year which itself makes it memorable via monthly themes- from Stalwarts' testimonials, photography & storytelling, webinars, donation campaign to innovation via blood spark & creative reels mirroring our fraternity's vibrant energy & unity.

We proudly upholds the tradition of recognizing brilliance through ISBTI awards & fellowships, spotlighting excellence in research, & donor motivation.

This years conference also features hands on pre conference workshops designed for cutting edge areas including Red Cell Genotyping, Transplant Compatibility & Histocompatibility, Advanced Immunohaematology, Therapeutic Apheresis, Nucleic Acid Testing, Cellular Therapy & Digitalization in Blood Banking.

Our scientific sessions promise to be equally enriching with plenary lectures from eminent national & international experts, engaging oral research presentations, case based discussions and thought provoking panel debates all about proud legacy with future horizons.

Your participation in this conference is a testament to the enduring spirit of collaboration and the shared commitment to excellence that defines our society. We are particularly grateful for the contributions of international experts who have joined us, enriching our discussions and further bolstering our collective knowledge

My sincere thanks to all members of Organising Committee for their tireless dedication & teamwork which reflects extend, commitment, collaboration & compassion the true spirit of ISBTI. I whole heartedly wish a grand success for Golden jubilee conference & wish all of us the very best.

Sangeeta

Dr. Sangeeta Pathak



Dr. Mohit Chowdhry
Organising Secretary-TRANSCON 2025
Treasurer - Indian Society of Blood Transfusion & Immunohaematology (ISBTI)

Dear Colleagues and Delegates,

It is with immense pride and gratitude that I welcome you all to TRANSCON 2025, the landmark Golden Jubilee celebration of the Indian Society of Blood Transfusion & Immunohaematology (ISBTI). Over the past five decades, ISBTI has been the cornerstone of excellence in blood transfusion services across India, promoting best practices and nurturing generations of transfusion medicine professionals. This Golden Jubilee conference represents not just a celebration of our past achievements but also our commitment to advancing transfusion medicine into the future.

TRANSCON 2025 brings together the brightest minds of our field under one roof. The scientific program features notable presentations, interactive workshops, and thought-provoking panel discussions. On behalf of the organisers, I can assure you that the knowledge shared and contacts made at TRANSCON 2025 will be invaluable in shaping the future of transfusion medicine. I extend my heartfelt appreciation to the distinguished faculty, generous sponsors, and the organizing committee whose tireless efforts have made this conference possible. Special gratitude goes to all our delegates who have chosen to be part of this historic golden jubilee gathering.

I'm delighted to welcome all my dear students, who have come to participate in our diverse range of events, including the postgraduate quiz, hands-on workshops, and scientific presentations. I am confident that these events will be both enriching and inspiring for your academic journeys.As you engage in the scientific sessions, networking opportunities, and cultural programs, I encourage you to embrace the spirit of collaboration and learning that has always been the ISBTI way.

The warm, cultural hospitality and atmosphere of Haryana, fondly called “India’s food bowl,” and the trendy “millennial city” of Gurugram, await you all. Together, let us celebrate our golden legacy while paving the way toward an even brighter future for transfusion medicine in India and beyond.Wishing you a productive, enriching and fun-filled conference experience.

With warm regards,



Dr. Mohit Chowdhry

From the Editors

It is with great pride and anticipation that we invite you to TRANSCON 2025, the Golden Jubilee celebration of the Indian Society of Blood Transfusion and Immunohematology (ISBTI), taking place in the historic and dynamic city of Delhi from September 19 to 21st, 2025.

This year's theme, **"Swaranjyanti Transcon - Past Triumphs and Future Horizons,"** honours five decades of dedicated service, groundbreaking research, and unwavering commitment to excellence in the field of transfusion medicine. It is a moment to celebrate our collective legacy while charting a visionary course for the future.

TRANSCON 2025 will serve as a confluence of knowledge, innovation, and inspiration bringing together esteemed experts, young professionals, researchers, and technologists from across the nation and beyond. The conference will feature a rich scientific program with keynote addresses, plenary sessions, workshops, and paper presentations, all aimed at addressing current challenges and future opportunities in transfusion medicine, cellular therapies, immunohematology, donor management, and more.

As we reflect on the milestones that have shaped our journey, TRANSCON 2025 also encourages us to look ahead toward emerging technologies, sustainable practices, and collaborative growth that will define the next era of transfusion science.

We warmly welcome you to be a part of this landmark event to celebrate, to contribute, and to envision a healthier tomorrow, together.

Join us in Delhi as we celebrate 50 golden years of ISBTI and step confidently into the future.



Dr. Anju Verma
Editor Souvenir Book



Dr. Anil Gupta
Editor Souvenir Book



About Delhi

IN & AROUND

Delhi, officially known as the National Capital Territory of Delhi (NCT), serves as the capital city of India. It is a vibrant metropolis renowned for its historical significance, cultural diversity, and political importance. Delhi is a preferred destination for national and international conferences, cultural festivals, and exhibitions. Its world-class convention centers and hotels make it ideal for hosting large-scale events.

Delhi's blend of history, culture, and modernity makes it a unique and dynamic city, offering something for everyone. Whether exploring its historical sites, enjoying its culinary delights, or engaging in business and education, Delhi continues to captivate visitors and residents alike.

India Gate

Located in: New Delhi

India Gate is a war memorial located in New Delhi, along the Rajpath. It is dedicated to the 82,000 soldiers, both Indian and British, who died during the First World War and the Third Anglo-Afghan War. India Gate looks stunning at night with the fountain displaying colourful lights. The surrounding lush green lawns are a popular picnic spot. The Amar JawanJyoti is also located here.



Red Fort

Located in: Old Delhi

The Red Fort is a historical fort in the old Delhi area, on the banks of Yamuna. Shah Jahan constructed it in 1639 as a result of a capital shift from Agra to Delhi. Built from red sandstone, it is home to several museums. Every year, the Indian Prime Minister unfurls the national flag here on the Independence Day.



Qutub Minar

Located in: Saket (South Delhi)

Highlights: Quwwat-ul-Islam mosque, Alai Darwaza, QutubMinar is a minaret or a victory tower located in the Qutub complex, a UNESCO World Heritage Site in Delhi's Mehrauli area. With a height of 72.5 metres (238 ft), QutubMinar is the second tallest monument of Delhi. The surrounding Qutub complex has lush green lawns which are popular picnic spot.



Lotus Temple

Located in: New Delhi

Located in the national capital of New Delhi, the Lotus Temple is an edifice dedicated to the Baha'i faith. The magnificent structure of this building unfolds in the form of a stupendous white petal lotus and is one of the most visited establishments in the world. The design of this shrine was conceptualized by Canadian architect FariborzSahba and was completed in the year 1986.



Humayun's Tomb

Located in: New Delhi

Humayun's tomb is the final resting place of the Mughal Emperor Humayun. Located in the Nizamuddin East area of Delhi, it is the first garden-tomb in India. This UNESCO World Heritage Site is known for the stunning typical Mughal architecture with Persian influences. The design of Humayun's tomb is a typical Mughal architecture with Persian influences and was conceptualised by Persian architect Mirak Mirza Ghiyath.



The Akshardham Temple

Located in: East Delhi

The Akshardham Temple, also known as Swaminarayan Akshardham is dedicated to Lord Swaminarayan. It is known for its stunning architecture. Akshardham complex is home to India's largest step well which a host to the mesmerising water show is each evening.



Jama Masjid

Located in: Old Delhi

Jama Masjid is the largest mosque in India built by Mughal Emperor Shah Jahan. The mosque hosts thousands of pilgrims each year on the holy occasion of Eid to offer special Namaz in the morning. Non-Muslims are not allowed inside the Masjid during Namaz offerings. One of the top attractions and best places to visit in Delhi, Jama Masjid gets a lot of tourist crowd other than the religious crowd.



Gurudwara Bangla Sahib

Located in: New Delhi

Gurudwara Bangla Sahib is one of the most important Sikh gurdwara, aka Sikh house of worship, in Delhi and known for its association with the eighth Sikh Guru, Guru HarKrishan, as well as the pool inside its complex, known as the 'Sarovar.' It was first built as a small temple by Sikh General SardarBhagel Singh in 1783, who supervised the construction of nine Sikh shrines in Delhi in the same year, during the reign of Mughal Emperor, Shah Alam II.



Lodhi Gardens

Located in: New Delhi

Lodhi Gardens is a city park placed in New Delhi, spanning over 90 acres. It is a luscious garden that houses the tombs of Sayyid ruler Mohammed Shah and Lodhi King SikandarLodhi. It is situated between Khan Market and Safdarjung's Tomb on Lodhi Road and is a favorite spot for morning walks for the Delhiites.



Rashtrapati Bhawan

Located in: New Delhi

Rashtrapati Bhawan is a famous monument of the British Empire which was said to be the palace of the Viceroy of India. It is now the home of the President of India. It is considered to be the best-known monument in India next to Taj Mahal and Qutub Minar.



Connaught Place

Located in: New Delhi

Officially named Rajiv Chowk, Connaught Place is better known as CP amongst the locals. It is one of the largest commercial and business centers in Delhi, and has been designed in two concentric circles namely Connaught's Inner Circle and Connaught's Outer Circle. Known since British era, this market has its own elegance. Known to be the most iconic structure from Lutyens Delhi, this is also among one the top places to visit in Delhi.



Khan Market

Located in: New Delhi

Khan Market is one of the hot spot and posh market in Delhi which serves as a perfect place for friends and family to hangout. Known to be one of the top places to visit in Delhi, the market has successfully held the essence of its original structure even in the times of rapid modernization. If you need to hang out late at night, Khan Market is the place for you as remains open till 12:00 AM.



Dilli Haat

Located in: New Delhi

Designed to invoke the ambience of a traditional village fair, DilliHaat is every shopper's paradise, a foodie's haven and the cultural magnet of the metro city. A flamboyant mix of vibrant colours and varied cultures, the bazaar is located in the commercial centre of South Delhi, bang opposite to the INA Market.



National Museum

Located in: New Delhi

Also known as the National Museum of India, the National Museum in New Delhi is one the largest museums in India, situated on the corner of the Janpath and Maulana Azad Road. Established in 1949, the blueprints of the majestic repository were prepared by the Gwyer Committee set up by the Government of India in 1946.



Safdarjung Tomb

Located in: New Delhi

Built in 1754, during the reign of Mughal Emperor- Ahmad Shah Bahadur, the namesake tomb is dedicated to the Prime Minister of the court- Safdarjung. Located in the heart of the city, at the junction of Safdarjung Road and Aurobindo Marg, the monument is a low-key tourist attraction of the city.



New Parliament House

Located in: New Delhi

The New Parliament House in Delhi is a part of India's Central Vista redevelopment project. It features a triangular design symbolizing India's democratic ethos and is equipped with modern technology and sustainability measures. The building houses larger Lok Sabha and Rajya Sabha chambers to accommodate future growth. Traditional Indian art and motifs blend with state-of-the-art facilities, reflecting India's rich heritage. It was inaugurated in May 2023, marking a new era in governance.



National War Memorial

Located in: New Delhi

The National War Memorial is a significant monument dedicated to honouring the soldiers who lost their lives in wartime service. Located in various countries, it typically features statues, inscriptions, and symbolic representations of sacrifice. In places like Canada and India, the memorial serves as a focal point for remembrance, often with ceremonies held on national holidays like Remembrance Day or Armed Forces Day. These memorials aim to preserve the memory of those who fought and died for their country, offering a space for reflection and gratitude.



Cyber Hub

Located in: Gurugram

Cyber Hub is the epitome of modernity and culture in Gurugram, offering a blend of dining, entertainment, and socializing opportunities. Immerse yourself in the lively atmosphere of Cyber Hub and savor the best food and entertainment options it has to offer.





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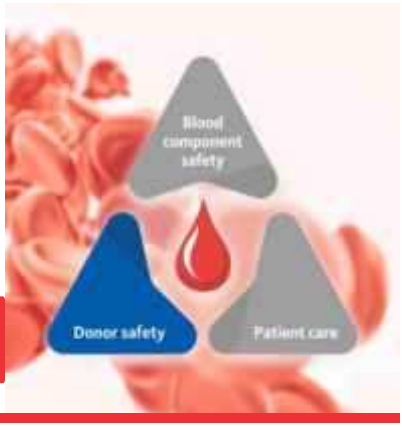

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About TRANSCON 2025

About TRANSCON 2025

50th TRANSCON

Golden Jubilee of The Annual National Conference of Indian Society of Blood Transfusion & Immunohematology

Celebrating Fifty Years of Progress and Service

Conference Theme : Past Triumphs & Future Horizons

The year 2025 is a landmark in the history of the Indian Society of Blood Transfusion and Immunohaematology (ISBTI) as it celebrates the Golden Jubilee of its annual conference, Transcon. The Swaranjyanti year is not only a celebration of fifty years of academic excellence but also a tribute to the extraordinary journey of ISBTI in shaping the nation's transfusion landscape. What began as a small collective of visionaries in the early 1970s has grown into a nationwide movement that integrates science, service, and voluntary spirit. With the Golden Jubilee theme "Past Triumphs & Future Horizons," ISBTI honours its legacy while looking ahead to new opportunities.

Foundations in the 1970s: Building a Movement

ISBTI was founded at a time when India's transfusion services were fragmented, largely dependent on replacement donations, and in urgent need of structure and reform. A group of pioneers recognized that progress could only be achieved through a scientific society dedicated to advancing knowledge, harmonizing practices and promoting voluntary blood donation. Out of this vision, ISBTI was born, with the twin goals of ensuring safe and adequate blood supply and advancing the science of immunohaematology.

The first Transcon of 1972 organized under the banner of ISBTI, was modest in size but rich in spirit. It brought together doctors, scientists, and volunteers who were united by the belief that blood donation is not only a medical necessity but also a social responsibility.

Evolution of Transcon: Five Decades of Growth

Over the years, Transcon evolved into a premier academic event, reflecting the rapid developments in transfusion medicine and allied sciences. Each decade of Transcon mirrors the progress of the field. In the 1970s and 1980s, the focus was on promoting voluntary blood donation, establishing safe practices, and building structured blood transfusion services. In the 1990s, the conversations turned toward component therapy, quality assurance, and hemovigilance, as India sought to align itself with international safety standards. The 2000s marked the entry of molecular diagnostics, advanced immunohaematology. The 2010s witnessed the expansion of Transcon into new domains such as stem cell transplantation, cellular therapies, and public-private partnerships in blood services.

The current decade has brought new priorities: digital transformation, patient blood management and the integration of transfusion services into broader patient safety and sustainability frameworks. Through every era, Transcon has been more than a conference. It has been a platform for knowledge, a policy influencer and an inspiration for countless professionals and volunteers.

The Swaranjyanti Year: A Celebration Beyond a Conference

For its Golden Jubilee, ISBTI envisioned not a three and half -day event – including the Preconference workshops, but a year-long celebration of achievements and values. Each month carried a distinct theme, ensuring that the celebrations reached far beyond the conference venue. The year began in January with testimonials from stalwarts, highlighting the memories and vision of ISBTI's pioneers. February celebrated the art of photography with the contest "Inspire", while March brought humour and creativity through a "Meme and Caricature Challenge". In April, the focus shifted to academics with "Wise Wednesdays Webinars" hosted across the country. May nurtured the literary spirit through "Ink in Our Veins", a writing contest for stories and poems on blood donation. June introduced the "Tree of Life campaign", where every blood donation was symbolically represented as a leaf on a growing digital tree. The celebratory tone continued in August with the "Blood Reels" contest, where transfusion professionals got an opportunity to showcase their hidden talents and bring out the lighter side of TM life in short videos.

About TRANSCON 2025

“The Firsts” that make the Golden Jubilee Special

TRANSCON 2025 is distinguished by several first-time initiatives that intend to make the celebrations truly memorable. The launch of the Conference Mascot, **Aveer,** brings a new identity to the event. Symbolizing vitality, hope and the life-giving gift of blood, Aveer has become an instant success.

The **“Go Green initiative”** marks a shift toward sustainability, with eco-friendly practices woven into every aspect of the celebrations. Paperless communication, reusable conference materials and carbon-offset campaigns underscore ISBTI's commitment to protecting both lives and the planet as a whole.

A dedicated mobile app has been introduced, providing participants with schedules, abstracts and interactive features while reducing paper usage.

As we gather in the vibrant city of Delhi NCR, let us all rejoice a landmark occasion in the history of Transfusion Science, taking pride in our rich past, celebrating of the present and a commitment to future, living up to its **Golden Jubilee theme: “Past Triumphs & Future Horizons.”**



Organising Committee

Chief Patron



Mr Abhay Soi

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Dr. Mohit Chowdhry



Dr. Sangeeta Aggarwal



Dr. Rahul Katharia



Dr. Vivek Ranjan

Social Media Committee Chairperson



Dr. Mohit Chowdhry

Social Media Committee Members



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Dr. Gunjan Bharadwaj



Dr. Divya Setya



Dr. Amit Aggarwal



Dr. Suhasini Sil

Souvenir Committee Chairpersons



Dr. Anju Verma



Dr. Anil Gupta

Souvenir Committee Co-Chairpersons



Dr. Gopal Pattidar



Dr. Abhinav Verma

Souvenir Committee Members



Dr. Anjali Hazarika



Dr. Vidushi Gupta

Hall and Stage Management Committee



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Dr. Rashmi Sood



Dr. Mahima



Dr. Harkiran Arora

Evaluation and Feedback Committee



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Dr. Seema Dua



Dr. Rita Rai



Dr. Reena Bansal



Dr. Garima

Past Triumphs & Future Horizons
TRANSCON 2025



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- Dr. Abhinav Verma
- Dr. Aditi Goel
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- Dr. Ajay Gandhi
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Transfusion Medicine and Cell Therapie

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Blood component preparation with integrated leukocyte depletion



CompoStop
Preparation of Leukocyte Depleted Platelet Concentrates from Buffy Coat Pools



BioR and BioP Flex Filters
(Lab side and Bed side)
Leukocyte Depletion for Red Cell and Platelet Concentrate



CompoFlex
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Improved technology for portable and safe sealing



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Go Green Initiative

Go Green Initiative

Scientific conferences have long served as platforms for knowledge exchange, collaboration, and innovation, yet they also leave behind a substantial environmental footprint. Studies highlight this often-overlooked impact. Uhrin AV et al. (2021), in their study "Walking the Talk: The Responsibility of the Scientific Community for Mitigating Conference-Generated Waste," estimated that a single scientific conference with 500 to 1000 attendees has the potential to generate 950 to 1900 kg of waste per day, with 400 to 800 kg ending up in landfills. Similarly, Burtscher L et al. (2020), in their study "The Carbon Footprint of Large Astronomy Meetings," noted recurring challenges such as waste generation, excessive paper use, and energy consumption.

The message is clear; while scientific meetings advance knowledge, they also contribute significantly to environmental degradation and this contradiction must be urgently addressed.

As responsible professionals, particularly within healthcare, we must recognize that environmental health is inseparable from human health. In 2017, the World Bank, in collaboration with "Health Care Without Harm," published an estimate showing that the healthcare sector generated 2.6 billion of the 52 billion metric tons of CO2 globally emitted in 2011, accounting for nearly 5% of global emissions.

Conferences, though temporary events, magnify this responsibility as they combine waste generation, food consumption, and travel emissions. It is therefore incumbent upon the scientific community to integrate sustainability into conference culture. Small but consistent actions, such as reducing single-use plastics, minimizing food waste, adopting digital platforms, and encouraging greener mobility, can create a meaningful shift when practiced collectively.

With this understanding, the Golden Jubilee Edition of the Annual National Congress of ISBTI Transcon 2025 has pledged to adopt a **"Go Green Initiative."** In conjunction with celebrations of ISBTI's Swaranjyanti year, the congress intends to not merely be a scientific gathering but also a reflection of values, a beacon of responsibility and a testimony to how science and sustainability can walk hand in hand to define the future. In line with its theme, **"Past Triumphs & Future Horizons,"** the Golden Jubilee Congress aspires to transcend traditional boundaries by uniting medical science with environmental stewardship. Through the **"Go Green Initiative."** ISBTI affirms its dual commitment, to safeguard human health and to preserve the planet. This endeavour is not merely an initiative but a legacy in the making, one that will set a transformative precedent for future conferences and inspire generations to come.

Recognizing that achieving an absolute zero-waste conference is nearly impossible, the organizers have chosen to work along a "zero-waste spectrum." This approach acknowledges practical limitations while rejecting the acceptability of generating large amounts of conference waste. By prioritizing areas with the greatest environmental impact, such as single-use plastics, food waste, and energy use, the initiative focuses on creating measurable, meaningful reductions in waste output.

A major focus will be the elimination of single-use plastics. Scientific meetings worldwide have been criticized for their reliance on bottled water, disposable cutlery and laminated conference materials. A digital-first approach will replace traditional printed items such as abstracts, schedules, and handouts. The Transcon 2025 mobile app embodies this approach, providing dynamic access to schedules, scientific content, and interactive features. This will not only lower environmental impact but also improve accessibility and convenience for delegates.

Venue and mobility planning will further reinforce sustainability. Delegates will be encouraged to use public transportation, carpooling or shuttle services to reduce vehicular emissions, which remain a major contributor to conference carbon footprints. Within the venue, waste segregation and recycling stations will be prominently placed to promote responsible disposal. Decorations and installations will be designed using biodegradable or reusable materials, ensuring that the aesthetics of the event align with its environmental vision.

Attendees will also be invited to pledge personal commitments to eco-friendly practices, transforming the initiative into a collective movement rather than a top-down directive. By doing so, Transcon 2025 hopes to inspire participants to extend green practices beyond the conference setting and into their daily lives and workplaces. Literature suggests that

active delegate involvement not only strengthens adherence to sustainable practices but also creates a ripple effect that extends well beyond the event.

Transcon 2025 is not just another conference. It is a milestone where science, sustainability, and solidarity converge. By joining hands in this path-breaking initiative, we can ensure that the Golden Jubilee year is remembered not only for its scientific advances but also for its environmental conscience.

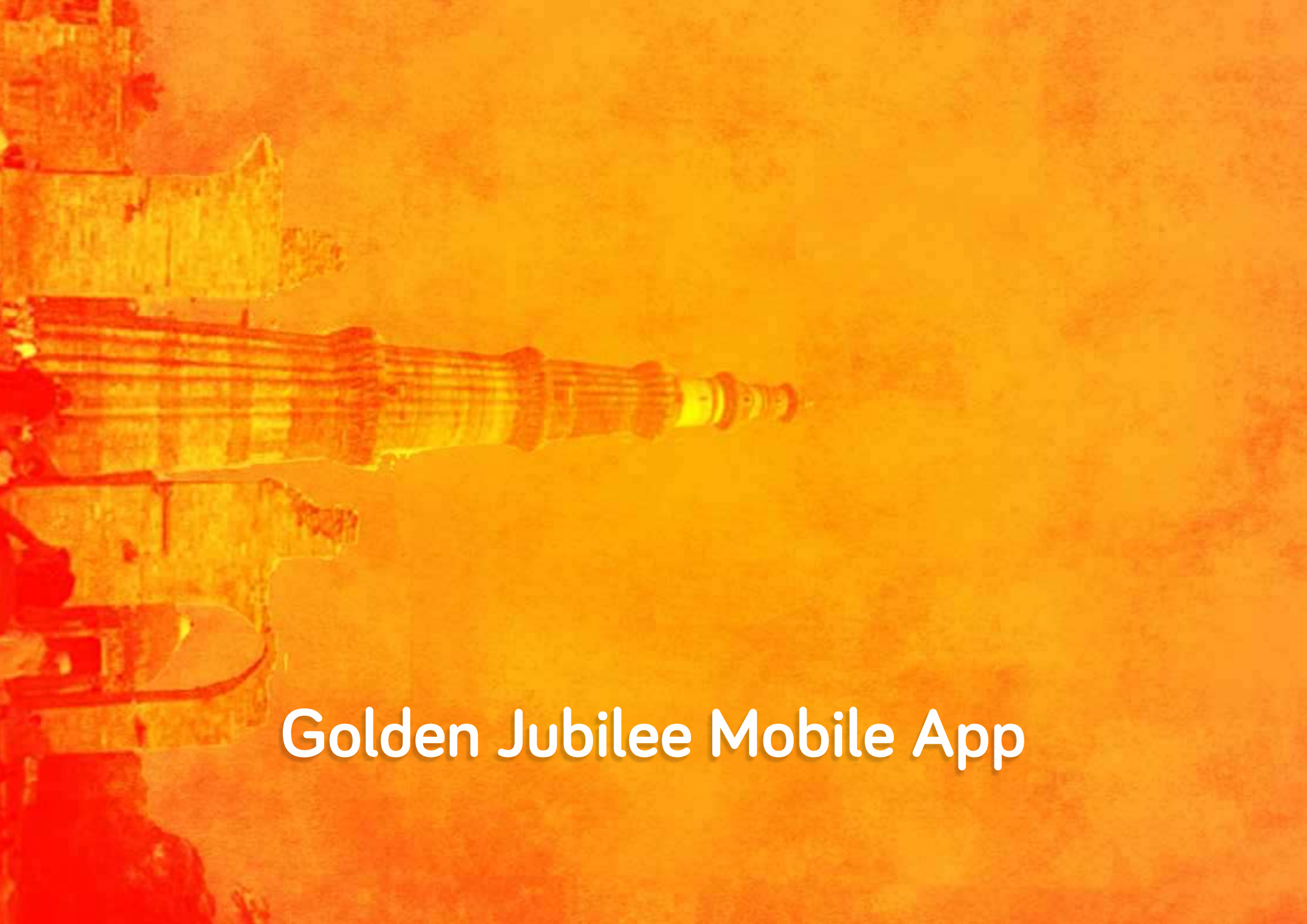
Together, let us be the change, celebrate responsibly, and leave behind a legacy that will make future generations proud!

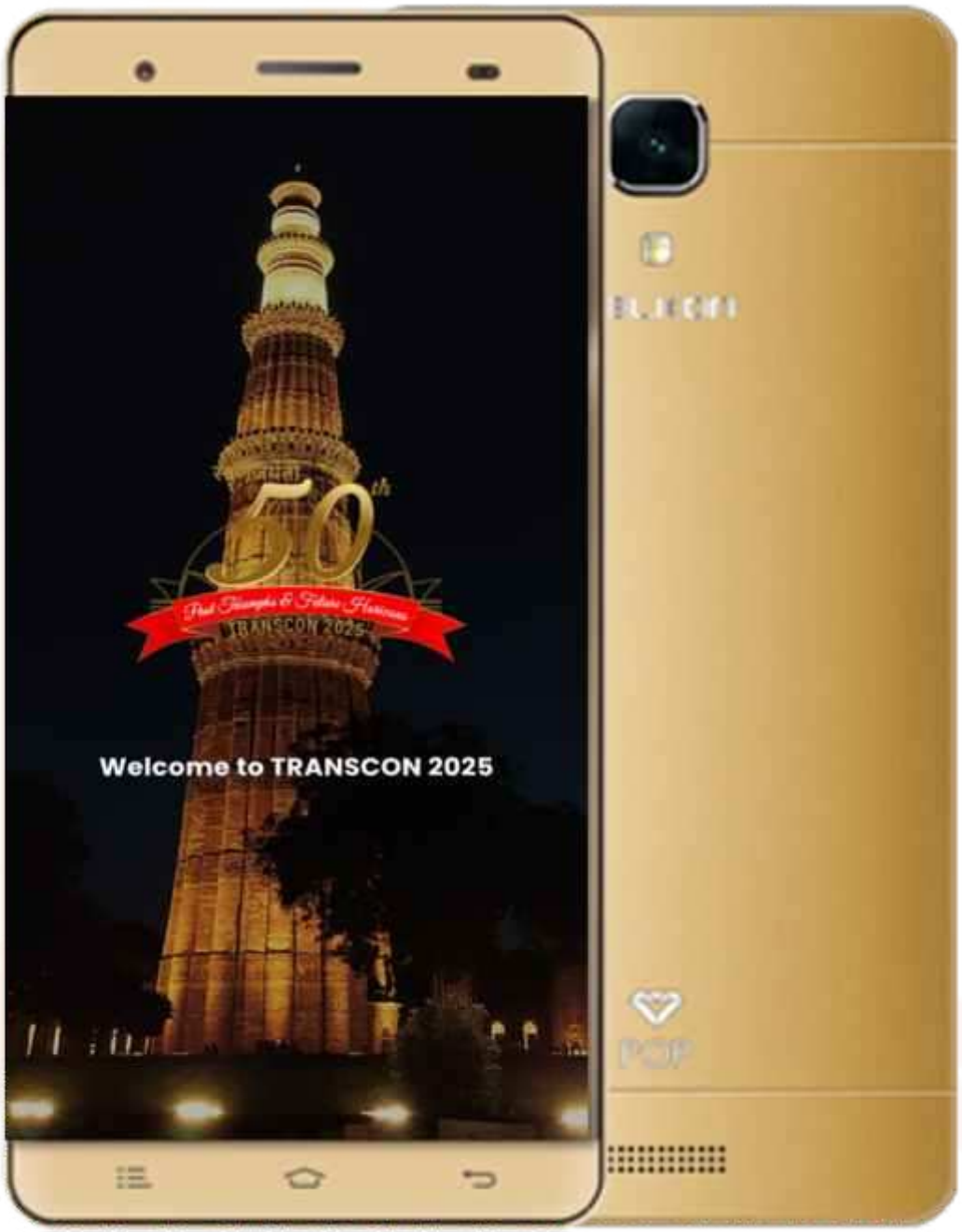
Dr. Sangeeta Pathak
Organising Chairperson

Dr. Mohit Chowdhry
Organising Secretary

Dr. Rasika Setia
Joint Organising Secretary

Dr. Rahul Katharia
Joint Organising Secretary


Golden Jubilee Mobile App



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SEARCH : TRANSCON 2025


Introducing - AVEER

Our Official Mascot - AVEER

For many years, we have been on a quest to identify the perfect mascot that embodies our values, our commitment to blood donation, and our passion.

We are excited to share that we have found it!
The celebrations for the TRANSCON Golden Jubilee year provide an excellent occasion to introduce "Introducing Aveer"

Why AVEER?

AVEER is more than just a mascot! **"AVEER"(अवीर)** originates from Sanskrit means "courageous, powerful, and fearless." These qualities resonate profoundly with blood donors and represent the life-saving impact of blood. AVEER embodies vitality, purity, and well-being, aligning perfectly with the goals of the Indian Society of Blood Transfusion and Immunohematology (ISBTI). It captures the spirit of strength, life, and the noble act of blood donation. AVEER stands as a delightful yet modern mascot that represents our youth, the future of our nation.





Monthly Themes

Monthly Themes

JANUARY
TESTIMONIALS FROM STALWARTS

FEBRUARY
PHOTOGRAPHY CONTEST

MARCH
MEMES & CARICATURES/CARTOON CHALLENGE

APRIL
WISE WEDNESDAYS WEBINARS (W3)

MAY
THE WORDSMITHS, THE RHYMESTERS & STORYTELLERS CONTEST

JUNE
TREE OF LIFE - BLOOD DONATION ONLINE CAMPAIGN

JULY
BLOOD SPARK - THE FUTURE IS FLOWING!

AUGUST
BLOOD REELS - GROOVE TO THE BEAT OF TRANSFUSION MEDICINE!

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MISSION

To achieve global recognition and trust as an Indian biopharmaceutical company, dedicated towards improving the health and quality of life of patients.

VISION

We aim to provide a wide range of safe blood plasma and speciality care products to patients globally, on a consistent basis.

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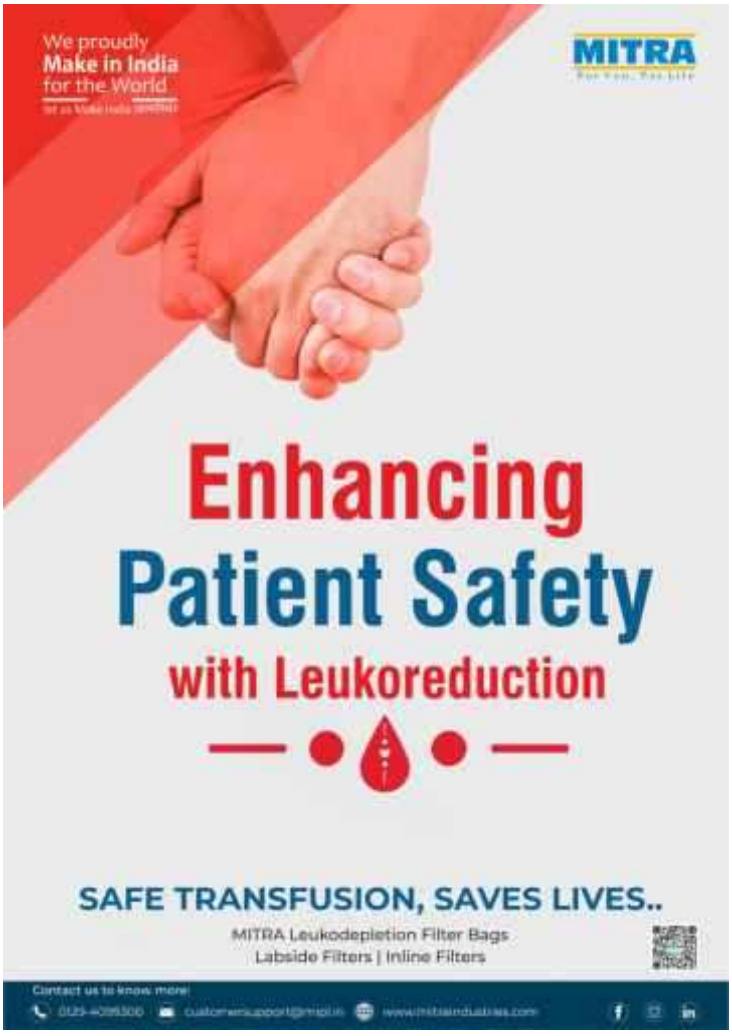



Pre-Conference Workshops

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स्वर्णजयंती 50th
Past Triumphs & Future Horizons
TRANSCON 2025

Since 1973
ISBTI



50th Annual Conference of ISBTI- TRANSCON 2025
Preconference Workshop
CellCure : Workshop on Cellular Therapy

Venue: Blood Centre, Amrita Hospital, Faridabad
Date and Time: 18th September 2025, 9 am to 4:30 pm

Program Schedule		
TIME	**TOPIC**	**SPEAKER**
8:00 am - 9:00 am	Registration and Welcome	Dr Rahul Katharia & Dr Amardeep Pathak
9:00 am - 9:15 am	Cart-T cells: Clinical Perspectives	Dr Prashant Mehta
9:15 am - 9:30 am	Leukapheresis as the Gateway to Cellular Therapy: *From Stem Cells to Super Cells*	Dr Swati Pabbi
9:30 am - 9:45 am	Enumeration of CD 34, CD 3 and others	Dr Nupur Das
9:45 am - 10:00 am	Extracorporeal Photopheresis: Clinical Aspects	Dr Pramod Yadav
10:00 am - 10:15 am	Need for GMP Labs in Cellular Therapy Program	Dr Anubhav Pandey
10:15 am - 10:30 am	Stem Cell Registry and Cellular Therapy	Dr Nitin Agarwal
10:30 am - 10:45 am	Whole Blood Automation: Component Processing	Dr Rahul Katharia
10:45 am - 11:15 am	Inauguration and Tea Break	
Hands-on Teaching and Training		Clinical Co-ordinator: Dr Swati Pabbi Technical Co-ordinator: Mr. Deepak Kumar
11:15 am - 12:15 pm	Harvesting of Cells	Mr Pavan Pal & Terumo BCT Team
12:15 pm – 12:30 pm	Whole Blood Automation: *Reveos (Terumo BCT)* Demonstration	Mr Ashok Kumar & Terumo BCT team
12:30 pm - 1:30 pm	CD34 Enumeration by Flow Cytometer	Dr Nupur Das & Dr Kusum Gupta
1:30 pm - 2:00 pm	Lunch	
2:00 pm - 2:45 pm	ECP the Technology, Live Demo ECP	Mr Himanshu Bambardekar, Mr Mohd Imtiyaz & Mr Om Prakash
2:45 pm - 3:30 pm	Cryopreservation of Cells, Live Demo Cryopreservation	Mr Yashpal & Mr Tarun Kumar
3:30 pm - 4:00 pm	Visit to GMP Lab	Dr Anubhav Pandey & Mr Deepak Kumar
4:00 pm onwards	Certificate Distribution followed by Tea	

Organising Chairperson	Organising Secretary	Workshop Organiser	Workshop Organiser
TRANSCON 2025	TRANSCON 2025	Dr Rahul Katharia	Dr Amardeep Pathak
Dr Sangeeta Pathak	Dr Mohit Chowdhry		

TERUMO

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50th Annual Conference of ISBTI- TRANSCON 2025
Preconference Workshop
CodeRed: Workshop on Red Cell Genotyping

Venue: Auditorium, Indraprastha Apollo Hospital, New Delhi

Date and Time: 18th September 2025, 9 am to 4:30 pm

Program Schedule		
TIME	**TOPIC**	**SPEAKER**
8:30 am Onwards	Registration	
9:00 am - 9:05 am	Welcome Address	Dr Mohit Chowdhry
9:05 am - 10:00 am	Inauguration and Lamp Lighting	**Chief Guest:** **Mr P Shivakumar**, Managing Director, Indraprastha Apollo Hospitals **Guest of Honor:** **Lt. Gen (Dr) Bipin Puri** DMS, Indraprastha Apollo Hospitals
10:00 am - 10:30 am	Blood Group Genetic Diversity in India: Clinical Challenges	Dr Anil Handoo
10:30 am - 10:45 am	High Tea	
10:45 am - 11:15 am	Improving blood transfusion safety- Molecular Blood group typing- why and how	Dr Stephan, Inno-Train
11:15 am - 11:45 am	Using SSP in Red Cell Genotyping: Real life Cases- INDIAN EXPERIENCE	Dr Suvro S Datta
11:45 am - 12:30 pm	Q&A SESSION	All Speakers
12:30 pm - 1:30 pm	Lunch	
1:30 pm - 4:00 pm	Demonstration and Hands-on FLUOQUBE Real Time PCR	Dr Stephan (Inno-Train), Dr Soma Agrawal, Dr Himani Aneja, Dr Manoj Kumar, Ms. Ayushi, Mr. Prakash, Mr. Uday
4:00 pm - 4:30 pm	Vote of Thanks	Mr. Mannoj Panwar (CellCare-Solutions)

Organising Chairperson
TRANSCON 2025
Dr Sangeeta Pathak

Organising Secretary (TRANSCON 2025) and Workshop Organiser
Dr Mohit Chowdhry

Workshop Organiser
Dr Suvro S Datta

Cellcaresolutions
A Blood Care Device Enterprise



50th Annual Conference of ISBTI- TRANSCON 2025
Preconference Workshop
Hemocode: Advanced ImmunoHaematology Workshop

Venue: K.L.WIG Centre for Medical Education Technology & Innovation (CMETi), AIIMS, New Delhi

Date and Time: 18th September 2025, 9 am to 5:30 pm

Program Schedule			
TIME	**TOPIC**	**GROUP 1 & 2 MODERATORS**	**Group 3 & 4 MODERATORS**
9:00 am - 9:15 am	Registration		
9:15 am - 9:30 am	Introduction & Team Formation		
9:30 am - 10:30 am	Serological problems and Solutions of multiple alloantibodies case	Dr Hem Chandra Pandey Dr Gopal K Patidar	Dr Rahul Chaurasia Dr Satyam Arora Dr Esha Toora
10:30 am - 11:00 am	Tea Break		
11:00 am - 12:30 pm	Continue with case of multiple alloantibodies	Dr Hem Chandra Pandey Dr Gopal K Patidar	Dr Rahul Chaurasia Dr Satyam Arora Dr Esha Toora
12:30 pm - 1:00 pm	Discussion & QA Session	All Faculties	
1:00 pm - 2:00 pm	Lunch Break		
2:00 pm - 3:30 pm	Serological problems and Solutions in AIHA	Dr Rahul Chaurasia Dr Satyam Arora	Dr Hem Chandra Pandey Dr Gopal K Patidar Dr Esha Toora
3:30 pm - 4:00 pm	Tea break		
4:00 pm - 5:00 pm	Continue with AIHA case	Dr Rahul Chaurasia Dr Satyam Arora	Dr Hem Chandra Pandey Dr Gopal K Patidar Dr Esha Toora
5:00 pm - 5:30 pm	Discussion & QA Session	All Faculties	

Organising Chairperson
TRANSCON 2025
Dr Sangeeta Pathak

Organising Secretary
TRANSCON 2025
Dr Mohit Chowdhry

Workshop Organiser
Department of Transfusion Medicine, AIIMS, New Delhi



50th Annual Conference of ISBTI- TRANSCON 2025
Preconference Workshop
MATCH Workshop: Medical Assessment for Transplant Compatibility & Histocompatibility

Venue: Advanced IH Laboratory, Molecular and Transplant Immunology, Department of Transfusion Medicine, UG Floor, Medanta The Medicity, Sector 38, Gurugram, Haryana
Date and Time: 18th September, 8:30 AM – 5:00 PM

Program Schedule		
TIME	**TOPIC**	**SPEAKER**
8:30 am - 9:00 am	Registration	
9:00 am - 9:05 am	Welcome Address	Dr. Aseem Kumar Tiwari
9:05 am - 9:15 am	Pre-test Questionnaire for Participants	
9:15 am - 9:30 am	Overview of HLA Typing and CDC Crossmatch	Dr. Nitin Dayal
9:30 am - 10:50 am	Hands on HLA Typing and CDC Crossmatch	Molecular and Transplant Immunology Laboratory
10:50 am - 11:05 am	Introduction to Flow Cytometry Crossmatch	Dr. Rajni Chauhan
11:05 am - 11:35 am	Tea/Coffee Break	
11:35 am - 12:55 pm	Hands on HLA Antibody Screening and Single Antigen Bead (SAB) Assay	Molecular and Transplant Immunology Laboratory
12:55 pm - 1:55 pm	*Lunch Break*	
1:55 pm - 2:10 pm	HLA Antibody Screening and Single Antigen Bead (SAB) Assay	Dr. Ankit Mathur
2:10 pm - 2:20 pm	Algorithm for Pre-transplant Compatibility Testing	Dr. Aseem Kumar Tiwari
2:20 pm - 3:40 pm	Hands-on Flow Cytometry Crossmatch	Molecular and Transplant Immunology Laboratory
3:40 pm -3:55 pm	Non-HLA Antibodies, Eplet Matching and Post-Transplant monitoring	Prof. Dolly Daniel
3:55 pm - 4:25 pm	Tea/Coffee Break	
4:25 pm - 4:45 pm	Open Discussion	
4:45 pm - 4:55 pm	Post-test Questionnaire for Participants	
4:55 pm - 5:00 pm	Thank You Note	Dr. Gunjan Bharadwaj

Organising Chairperson
TRANSCON 2025
Dr Sangeeta Pathak

Organising Secretary
TRANSCON 2025
Dr Mohit Chowdhry

Workshop Organiser
Dr Aseem Kumar Tiwari

Workshop Organiser
Dr Rajni Chauhan

Workshop Organiser
Dr Nitin Dayal



50th Annual Conference of ISBTI- TRANSCON 2025
Preconference Workshop
ScreenSure: Workshop on Nucleic Acid Testing (NAT) in Transfusion Medicine

Venue: Meditorium First Floor, Fortis Memorial Research Institute, Gurugram

Date and Time: 18th September, 9 am to 4:30 pm

Program Schedule			
TIME	**TOPIC**	**SPEAKER**	**CHAIRPERSONS**
9:00 am - 10:00 am	Registration & High Tea		
10:00 am - 10:30 am	Inauguration of Workshop		
10:30 am - 11.00 am	Basics of NAT and its Significance	Dr Anoop Sharma	Dr Anju Verma & Dr Seema Sinha
11:00 am - 11:45 am	NAT Testing Principles and Processes	Dr Deepti Sachan	
11:45 am - 12:00 pm	Activity		
12:00 am - 12:45 pm	15 years Long Journey of NAT	Dr Poonam Shrivastava	Dr R N Makroo & Dr Anita Mittal
12:45 pm - 1:00 pm	Q & A Session		
1:00 pm - 1:45 pm	Lunch Break		
1:45 pm - 2:15 pm	Activity		
2:15 pm - 3:00 pm	Algorithm and Interpretation of Discrepant Results	Dr Gita Negi	Dr Mausami Swami & Dr Sangeeta Agarwal
3:00 pm - 3:15 pm	Activity		
3:15 pm - 3:45 pm	Centralized NAT Testing – SWOT Analysis	Dr Shweta Nayak	Dr Varun Capoor & Dr Kamini Khillan
3:45 pm - 4:00 pm	Q & A Session		
4:00 pm - 4:30 pm	Valedictory Followed By Tea		

Workshop Organiser	Organising Secretary	Organising Chairperson
TRANSCON 2025	TRANSCON 2025	TRANSCON 2025
Dr Sangeeta Agarwal	Dr Mohit Chowdhry	Dr Sangeeta Pathak



50th Annual Conference of ISBTI- TRANSCON 2025
Preconference Workshop
Smart Bank: Workshop on Digitalization in Blood Banking

Venue: Auditorium, BLK Max Hospital, New Delhi
Date and Time: 18th September, 8 am to 5 pm

Program Schedule		
TIME	**TOPIC**	**SPEAKER**
8:00 am - 9:00 am	Delegate Registration & Breakfast	
9:00 am - 9:10 am	Welcome Address	Dr Rasika Setia
9:10 am - 9:30 am	From Registers to Software: The Digital Journey of Blood Banking	Dr Mitu Dogra
9:30 am - 9:50 am	Integrating RFID into Blood Centre Software: Key Steps for a Seamless Transition	Mr Azad Kumar
9:50 am - 10:10 am	From Paper Labels to RFID Tags: A Safer Future	Dr Richa Gupta
10:10 am - 10:30 am	Application of Digitization in Transfusion Medicine: Case-based Studies	Dr Amena Ebadur Rahman
10:30 am - 10:50 am	Distribution of Groups and Allocation of Cases	
11:00 am - 12:00 pm	Hands-on Training -Team Activity	
12:00 pm - 1:00 pm	Hands-on Training -Team Activity	
1:00 pm - 2:00 pm	Lunch	
2:00 pm - 3:00 pm	Hands-on Training -Team Activity	
3:00 pm - 4:00 pm	Fun Activity + Participant Queries & Certificate Distribution	
4:00 pm - 4:10 pm	Vote of Thanks	
4:00 pm onwards	Tea Time	

Organising Chairperson
TRANSCON 2025
Dr Sangeeta Pathak

Organising Secretary
TRANSCON 2025
Dr Mohit Chowdhry

Workshop Organiser
Dr Rasika Setia

Workshop Organiser
Dr Richa Gupta



50th Annual Conference of ISBTI- TRANSCON 2025
Preconference Workshop
TheraPhere: Workshop on Therapeutic Apheresis

Venue: Institute of Liver & Biliary Sciences, New Delhi
Date and Time: 18th September, 8 am to 5 pm

Program Schedule		
TIME	**TOPIC**	**SPEAKER**
8:00 am - 9:00 am	Registration: Welcome & Interact	
9:00 am - 9:15 am	Overview of Workshop: Insights	Dr. Sadhana Mangwana
9:15 am - 9:45 am	Basics of TPE	Dr. Meenu Bajpai
9:45 am - 10:15 am	Clinical Rationale and Indications for TPE	Dr. Anil Khetrapal
10:15 am - 10:45 am	The Intricacies of TPE and Special Procedures	Dr. Rekha Hans
10:45 am - 11:00 am	Inaugural Address	Dr. S K Sarin
11:00 am - 11:15 am	Chai Pe Charcha	
11:15 am - 1:00 pm	Demonstration & Hands on (Basics)	Coordinator: Dr. Ashish Maheshwari Technical Coordinator- Mr. Pankaj Jain With All Faculty
1:00 pm - 2:00 pm	Tummy Time: A Brain Food Break	
2:00 pm - 2:30 pm	Therapeutic Cytapheresis	Dr. Sadhana Mangwana
2:30 pm - 3:00 pm	Complications and Risk Mitigation Strategies	Dr. Ashish Maheshwari
3:00 pm - 4:00 pm	TPE Demonstration-II (Advanced including uses of SPD)	Coordinator: Dr. Ashish Maheshwari Technical Co-ordinator- Mr. Pankaj Jain with All Faculty
4:00 pm - 4:30 pm	TheraPhere Quiz: A Knowledge Challenge	Dr. Apoorva Maheshwari
4:30pm - 5:00pm	Addressing Doubts and Closing Remarks	Dr. Meenu Bajpai
Beyond 5:00pm	Tea: Catered Cravings	

Organising Chairperson
TRANSCON 2025
Dr Sangeeta Pathak

Organising Secretary
TRANSCON 2025
Dr Mohit Chowdhry

Workshop Organisers
Dr Sadhana Mangwana
Dr Meenu Bajpai

Workshop Coordinator
Dr Ashish Maheshwari



Conference Programme

DAY 1 | 19TH SEPTEMBER 2025 | FRIDAY

8:00 am -9:00 am	REGISTRATION							
	Dr J G Jolly (HALL A)			Dr Zarin Soli Bharucha (HALL B)			Mrs Kanta Saroop Krishen (HALL C)	
Session 1	Roll up your sleeve, roll out hope (Voluntary Blood Donation)	Speakers	Session 2	The meaningful separation: Art and Science of Component Preparation	Speaker	Session 3	Trending in TM	Speakers
9:00 am-9:45 am	Chairpersons:	Dr V P Gupta, Dr Anju Verma , Dr T R Raina	9:00 am-9:45 am	Chairpersons:	Dr Anita Mittal, Dr R Sreelatha , Dr Meenakshi Sridhar	9:00 am-9:45 am	Chairpersons:	Dr Anju Dubey , Dr R P Singh, Dr Dinesh Arora
9:00 am-9:15 am	VBD in India : Past , present and future.	Mr. Apurva Ghosh	9:00 am-9:15 am	Optimizing yield and efficacy: Best practices in Blood component processing	Dr Atul Sonker	9:00 am-9:15 am	Scroll, Post, Save, Lives: # Transfusion Medicine- role of social Media in TM	Dr Ruchi Punamia
9:15 am-9:30 am	Centralised blood donation , testing and processing: is it practical and possible in Indian scenario?	Dr Suchet Sachdeva	9:15 am-9:30 am	Irradiation and storage of red blood cells	Dr Prashant Agarwal	9:15 am-9:45 am	AI and big data will replace the need for transfusion medicine specialists in future	Debate: For Dr Arwa Z Al-Riyami Or Against Dr Dinesh Arora
9:30 am-9:45 am	Legal and regulatory framework for blood donation.	Mr Hem Gupta	9:30 am-9:45 am	Pooled platelets as an alternative to SDP.	Dr Siddharth Mittal			
9:45 am-10:30 am	ISBTI ORATION : Transfusion Medicine Immunohematology in India: A perspective			Dr Poonam Srivastava			Dr Yudhbir Singh, Dr Sangeeta Pathak	
10:30 am-11:00 am	TEA/COFFEE BREAK							
11:00 am -12:30 pm	INAUGURAL CEREMONY							
12:30pm- 1:00 pm	Legal issue in medical practices: Current Prospective			Dr Girish Tyagi			Chairpersons: Dr Prashant Agarwal, Dr Suchet Sachdeva	
1:00 pm-2:00 pm	LUNCH BREAK							
Session 4	ISBT Global Leaders: Regional Impact	Speakers	Session 5	Stealthy Threats: The Quest to Outsmart TTI	Speakers	Session 6	One size doesn't fit all: precision, personalized and perfected (Precision medicine in TM)	Speakers
2:00 pm -3:40 pm	Chairpersons:	Dr Neelam Marwaha, Dr Mausumi Swami	2:00 pm - 3:40 pm	Chairpersons:	Dr Jitendra Vachani, Dr Haresh Saxena, Dr Sadhana Mangwana	2:00 pm -3:40 pm	Chairpersons:	Dr Veena Doda, Dr Chandrakant Agarwal, Ms Vinita Srivastava
2:00 pm -2:30 pm	How we forecast tomorrow's hemovigilance?	Dr. Shruthi Narayan	2:00 pm - 2:15 pm	Hepatitis B : Diagnostic challenges	Dr Jatin Ahuja	2:00 pm -2:20 pm	Red cell transfusion in patients with traumatic brain injury: Precision or Presumption	Dr Rahul Charausia
2:30 pm -3:00 pm	Rare Donor Registry: Where & how to find a suitable red cell product, if my patient has a rare blood group?	Dr Arwa Z. Al-Riyami	2:15 pm - 2:30 pm	TTI Litigations and Mitigations -Talk of the town	Dr Ravneet Kaur	2:20 pm -2:40 pm	Improving transfusion efficacy in Sickle Cell patients by adopting a precision medicine approach	Dr Smita Mahapatra
3:00 pm-3:20 - pm	Neonatal and Pediatric Transfusion Practices and Policies in India	Dr Satyam Arora	2:30 pm - 2:45 pm	Algorithmic Approach to TTI Testing	Dr Narinder Naidu Kaur	2:40 pm -3:00 pm	Patient blood management in Thalassemia	Dr Richa Gupta
3:20 pm - 3:40 pm	Update on National Hemovigilance Program of India	Dr Gopal Patidar	2:45 pm - 3:00 pm	Recent developments in blood screening.	Dr Paula Saa	3:00 pm - 3:20 pm	Health economics in precision Transfusion Medicine	Dr Anand Deshpande
			3:00 pm - 3:40 pm	Panel Discussion: Mission to outwit TTI and ensure safe and sufficient blood supply.	Moderator :Dr Ripal Shah Panliest: Dr Madhan Kumar , Dr Mamta Shah, Dr Gagandeep Kaur, Dr Amit Agarwal, ,Dr Prerna Sachdeva	3:20 - 3:40 pm	The Potential of Platelet Mapping: Exploring New Frontiers in Research and Clinical Care	Dr Anupam Verma
3:40-4:00 pm	TEA/COFFEE BREAK							
Session 7	The Clotting Symphony: fine balance of hemostasis	Speakers	Session 8	Tiny warriors: Platelet Granulocyte and Immune code	Speakers	Session 9	The Rules of the game: Ensuring & Assuring Reliability (Regulations /Accreditation)	Speakers
4:00 pm- 5:30 pm	Chairpersons:	Dr Madhu Chandra, Dr Daniel Joshua	4:00 pm- 5:30 pm	Chairpersons:	Dr R N Makroo, Dr B Shanthi, Dr Hitesh Narang	4:00 pm- 5:30 pm	Chairpersons:	Dr Bharat Singh, Mr Suresh Kalwania, Dr Awadesh Agarwal
4:00 pm - 4:20 pm	Coagulopathy of trauma with massive transfusion: Lessons from past; looking ahead	Dr Sukesh Nair	4:00 pm - 4:20 pm	Advances in detection and management of HLA and HPA alloimmunization	Dr Ram Mohan Jaiswal	4:00 pm - 4:20 pm	Legal aspects: how to be safe as a transfusion medicine specialists.	Dr Ashwini Setya
4:20 pm -4:40 pm	Case based approach to less recongnized caogualtion and platelet function disorders.	Dr Prasanna N Kumar	4:20 pm -4:40 pm	Role of Platelet crossmatch in platelet refractoriness in multitransfused patients	Dr Mohit Chowdhry	4:20 pm -4:40 pm	Hiking with Accreditation – Case Studies (Past, Present and Future)	Dr Atul Kulkarni
4:40 pm- 5:00 pm	Limitation of conventional coagulation testing in bleeding management	Dr Meena Sidhu	4:40 pm- 5:00 pm	Utilization audits of platelet transfusions	Dr Dheeraj Khetan	4:40 pm- 5:00 pm	Bridging the gap: homogenous implementation of the transfuion guidelines.	Dr Jayashree Sharma
5:00 pm -5:20 pm	Managing coagulopathy in liver transplant-Global Hemostatis versus Conventional coagulation tests	Dr Deepti Sachan	5:00 pm -5:20 pm	Challenges in assessing clinical efficacy of granulocyte transfusions: Re-emerging or obsolete?	Dr Amardeep Pathak	5:00 pm -5:20 pm	National Blood Transfusion Act (NBTA)	Dr N Vasawada
5:20 pm-5:30 pm	Disscussion		5:20 pm-5:30 pm	Disscussion		5:20 pm-5:30 pm	Disscussion	
5:30 pm-6:30 pm	AGM							
7:30 pm onwards	GALA DINNER							

DAY 2 | 20TH SEPTEMBER 2025 | SATURDAY

Dr J G Jolly (HALL A)			Dr Zarin Soli Bharucha (HALL B)			Mrs Kanta Saroop Krishen (HALL C)		
Session 10	**ORAL FREE PAPERS**		**Session 11**	**ORAL FREE PAPERS**	**Speaker**	**Session 12**	**ORAL FREE PAPERS**	**Speaker**
8:00 am-9:00 am	**Judges : Dr Milan Jaiswal, Dr Seema Gupta**		8:00 am-9:00 am	**Chairpersons: Dr Gita Negi, Dr Mamta Shah**			**Chairpersons: Dr Gagandeep Kaur, Dr Atul Sonkar**	
Session 13	**Data driven drops: The tech savvy transfusion series (Bioinformatics/AI/RFID/Automation)**	**Speakers**	**Session 14**	**Alchemy of Healing: Transformative Therapeutic Apheresis**	**Speakers**	**Session 15**	**Patient Blood Management**	**Speakers**
9:00 am-10:40 am	**Chairpersons:**	**Dr Tirtha Chalia, Dr Latha Balakrishna, Dr Smita Joshi**	**9:00 am-10:40 am**	**Chairpersons:**	**Dr Ashok Yadav, Dr Sajith Vilambil**	**9:00 am-10:40 am**	**Chairpersons:**	**Dr Yatin Mehta, Dr Sudha Rangnathan, Dr Sharad Jain**
9:00 am-9:20 am	Towards universal blood and blood components- Future perspective	Dr Rajesh Kumar	9:00 am-9:15 am	Therapeutic Apheresis: Principles, Practice and Changing Indications	Dr Aseem Tiwari	9:00 am-9:20 am	Roadmap towards Implementation of Patient Blood management in Resource- Constraint Countries	Dr Dolly Daniel
9:20 am - 9:40 am	Digital blood bank: If banks can go digital why not blood banks ?	Dr Rasika Setia	9:15 am -9:30 am	Tailoring Apheresis for Diverse Patient Populations	Dr Ujjwal Dimri	9:20 am - 9:40 am	PBM in action: Success stories	Dr Ajay Gandhi
9:40 am-10:00 am	AI in Transfusion Medicine : Practical Applications	Dr Rounak Dubey	9:30 am-9:45 am	TPE in ABO incompatible solid organ transplants	Dr Meenu Bajpai	9:40 am-10:00 am	Impact of Clinical audits to improve Patient Blood management	Dr Rahul Katharia
			9:45 am-10:00 am	Beyond Blood: Apheresis as a Gateway to Cell and Gene Therapies	Dr Divjyot Lamba			
10:00 am -10:40 am	**Panel**: Blood Transfusion Medicine in disaster management	Moderator: Dr Debashish Gupta Panelist: Dr Sangeeta Pahuja, Dr Smita Mahpatra, Dr Nidhi Bhatnagar, Dr Jayashree Sharma, Dr Rasika Setia	10:00 am -10:40 am	Panel: Indian Data on Therapeutic Apheresis: Registry Creation	Moderator: Dr Soma Agarwal, Panelist : Dr Anupa Phokhrel, Dr Neha Hurkat, Dr Kavitha Yevoor, Dr Soumya Das, Dr Pramod Yadav	10:00 am -10:40 am	**Panel discussion:** PBM - Panel discussion on various clinical scenarios	Moderator: Dr Anshika , Panelist: Dr Amita R, Dr Yashaswi Dhiman, Dr Anila Mathan, Dr Jatin Narula
10:40 am - 11:15 am	**TEA/COFFEE BREAK**							
Session 16	**The DNA diaries: Unlocking the code of life (Molecular)**	**Speaker**	**Session 17**	**NBTC - National HQ presentation**	**Speakers**	**Session 18**	**Transfuse like a Pro:Clinical Tools & Tactics**	**Speakers**
11.15 am -1.00 pm	**Chairpersons :**	**Dr Manisha Srivastava, Dr Debashish Gupta, Dr Nabajyoti Choudhury**	**11:15 am -1:00 pm**	**Chairpersons:**	**Dr Jayashree Sharma, Dr G P Saluja**	**11:15 am -1:00 pm**	**Chairpersons:**	**Dr Kulbir Kaur, Dr Priti Elhence**
11:15 am-11:30 am	Recent trends in Gene therapy	Dr Sangeeta Pathak	11:15 am-11:35 am	Achievements of Blood Transfusion Services	Dr.Megha Pravin Khobragade	11:15 am-11:35 am	Precision in transfusion practice- Do molecular endotypes determine response and transfusion outcomes	Dr Dolly Daniel
11:30 am-11:45 am	Global Experience sharing on NAT	Dr Jed Gorlin	11:35 am-11:55 am	Road map of BTS	Dr.Krishan Kumar	11:35 am-11:55 am	Antiplatelet therapy and transfusion needs – can we paint all with the same brush?	Dr Ganesh Mohan
11:45 am-12:00 noon	Molecular genotyping in Clinical Practice	Dr Suvro Shankha Datta	11:55 am-12:15 pm	Best Practises of the state, Madhaya Pradesh	State Representative	11:55 am-12:15 pm	Quality Assurance on Immunohematology	Dr Kamini Khillan
12:00 noon-12:15 pm	Unveiling the Genetic Polymorphism of Rh Blood group system through Multiplex PCR	Dr Swati Kulkarni	12:15 am-12:45 pm	Kerela, Jammu & Kashmir	Ms Sinu Kadakampally, AD (Kerala)	12:15 pm -1:00 pm	Debate: Is classical MTP still relevant? For and Against.	Dr. Nippun Prinja v/s Dr Divya Setya
12:15 pm-1:00 pm	Panel: Functional testing in Transfusion Medcine: Predicting Outome of Allo-antibodies	Moderator: Dr Rajeshwari Basavanna Panelist: Dr Divya Murugasamy, Dr Anubha Srivastava, Dr Hem Chandra Pandey, Dr Saroj Rajput	12:45 am-1:00 pm	Assam	State Representative			
1:00 pm-1:45 pm	**LUNCH BREAK**							
Session 19	**The Transplant Tango: A delicate dance between donor and recepient**	**Speakers**	**Session 20**	**A Shared Evolution: Building the ISBTI legacy**	**Speakers**	**Session 21**	**Powerful Partnerships: Synergy of Safer Blood**	**Speakers**
1:45 pm- 3:25 pm	**Chairpersons:**	**Dr Ram Mohan Jaiswal, Dr Nidhi Mehta**	**1.45 pm- 3.25 pm**	**Chairpersons:**	**Dr Yudhvir Singh, Dr Sangeeta Pathak, Dr T R Raina**	**1.45 pm- 3.25 pm**	**Chairpersons:**	**Dr Amit Sharma, Dr Ujjwal Dimri**
1:45 pm -2:05 pm	The complexity of donor choices- solid organ vs stem cell transplants	Dr Ankit Mathur	1:45 pm -2:00 pm	Bridging Generations: Passing the torch	Dr R N Makroo	1:45 pm -2:05 pm	Lipid Apheresis in India	Dr C Shivaram
2:05 pm -2:25 pm	Virtual vs Physical crossmatches – the ups , the downs and possible solutions	Dr Antonio Paul	2:00 pm -2:15 pm	TransMedAsia: European Commission supported Transfusion Medicine higher education program.	Dr Nabajyoti Choudhury	2:05 pm -2:25 pm	Neurology Meets Apheresis: The Role of TPE in Neuroimmune Disorders	Dr Rekha Hans
2:25 pm -2:45 pm	Luminex based Screeening for HLA antibodies	Dr Prashant Pandey	2:15 pm -2:30 pm	From my story to our story: First Blood Drive to national Impact	Dr Veena Doda	2:25 pm -2:45 pm	Hematopietic stem cell harvest in pediatric cases	Dr Satyam Arora
			2:30 pm-2:40 pm	Realising the Vision of Transfusion Services in India	Dr Neelam Marwaha			
2:45 pm -3:05 pm	HLA typing technology: Where are we?	Dr Atul Thatai	2:40 pm- 2:50 pm	Words of Wisdom	Dr Rama Bhasin	2:45 pm-3:05 pm	From Whole to Wise: Clinical Excellence Through Component Use	Dr Mohandoss Murugan
3:05 pm - 3:25 pm	Non-HLA Antibodies: Are they Significant?	Dr Ajay Barnwal	2:50 pm-3:25 pm	Mentors, Moments , Milestones	**Seniors:** Dr Kulbir Kaur, Dr Neelam Marwaha, Dr Rama Bhasin, Ms Raj Popli, Mr Arya, Mr Rampal Rohilla, Mr Balbeer Singh, Mr Prem Chand, Mr Rakesh Thapliyal, Ms Neera Bawa, Ms Meena Malhotra	3:05 pm-3:25 pm	Cuttingedge automation of blood component separation in resource constrained settings- A possibilty or a myth	Dr Dolly Daniel
3:25 pm - 3:45 pm	**TEA/COFFEE BREAK**							
Session 22	**Sowing seeds for a brighter tomorrow :Mastering the Art of Blood-ology (Training and education in TM)**	**Speakers**	**Session 23**	**Decode the blood code: A journey through Immunohematology**	**Speakers**	**Session 24**	**The Apheresis Lounge**	**Speakers**
3:45 pm -5:30 pm	**Chairpersons:**	**Dr Gita Negi, Dr Irfana Nikhat**	**3:45 pm -5:30 pm**	**Chairpersons:**	**Dr Gangandeep Kaur, Dr Poonam Srivastava**	**3:45 pm -5:30 pm**	**Chairpersons**	**Dr (Col) Satish Kumar, Dr Tulika Chandra**
3:45 pm-4:00 pm	One Nation One TM Teaching Program: Structured training in TM	Dr R Sreelatha	3:45 pm-4:00 pm	Healthy beginnings, Hopeful Futures:Role of IH in Antenatal Care	Dr Hem Chandra Pandey	3:45 pm-4:00 pm	Multi-component Collections: Pathway to Implementation	Dr Akshay Batra
4:00 pm-4:15 pm	How to conduct transfusion-related clinical research?	Dr Arghya Deep Marik	4:00 pm-4:15 pm	Cracking a complex IH case - how simple is this ?	Dr Sangeeta Pahuja	4:00 pm-4:15 pm	Donor lymphocyte infusion: Road forward	Dr Veena Shenoy
4:15 pm -4:30 pm	E-Learning Modules?Collaborative modules with hematology, critical care, pathology, and obstetrics	Dr B Shanthi	4:15 pm -4:30 pm	Meeting the transfusion needs of patients with complex immunohematology issues: Providing Solutions	Dr Aseem Tiwari	4:15 pm -4:30 pm	Red cell Exchange transfusion: Indications and Challenges	Dr Girija N Kanungo
4:30 pm -4:45 pm	Speciality clinics in TM	Dr Prasoon Bhattacharya	4:30 pm -4:45 pm	Small Lab Big Impact: How far can we go with a basic Immunohematology Lab?	Dr Sudipta Sekhar Das	4:30 pm -4:45 pm	Extra corporeal Photopheresis technique: How effective in GvHD	Dr Ravindra
4:45 pm-5:30 pm	Panel Discussion: Evidence based teaching in TM: How to do bench side teaching and problem based learning.	Moderator: Dr Nidhi Bhatnagar : Panelist: Dr Atul Sonker, Dr Amita R, Dr Prasun Bhattacharya, Dr Parimala Puttaiah, Dr R Sreelatha	4:45 pm-5:30 pm	Panel Discussion: Immunohaematology in India- Past , present and future	Moderator : Dr Daljit Kaur. Panelist: Dr Poonam Srivatava, , Dr Shubham Gupta, Dr Paresh Vyasa, Dr C Dhinesh Kumar	4:45 pm-5:30 pm	Frontiers of Aphersis: Exploring, Evidence, Ethics and Economics	Moderator: Dr Meenu Bajpai. Panelist: Dr Aditi Goel , Dr Swati Pabbi, Dr Rashmi Sood, , Dr R Ashwin
2:00 pm -5:00pm	**POSTER SESSION (Parallel to sessions)**							
7:00 PM onwards	**GALA DINNER**							

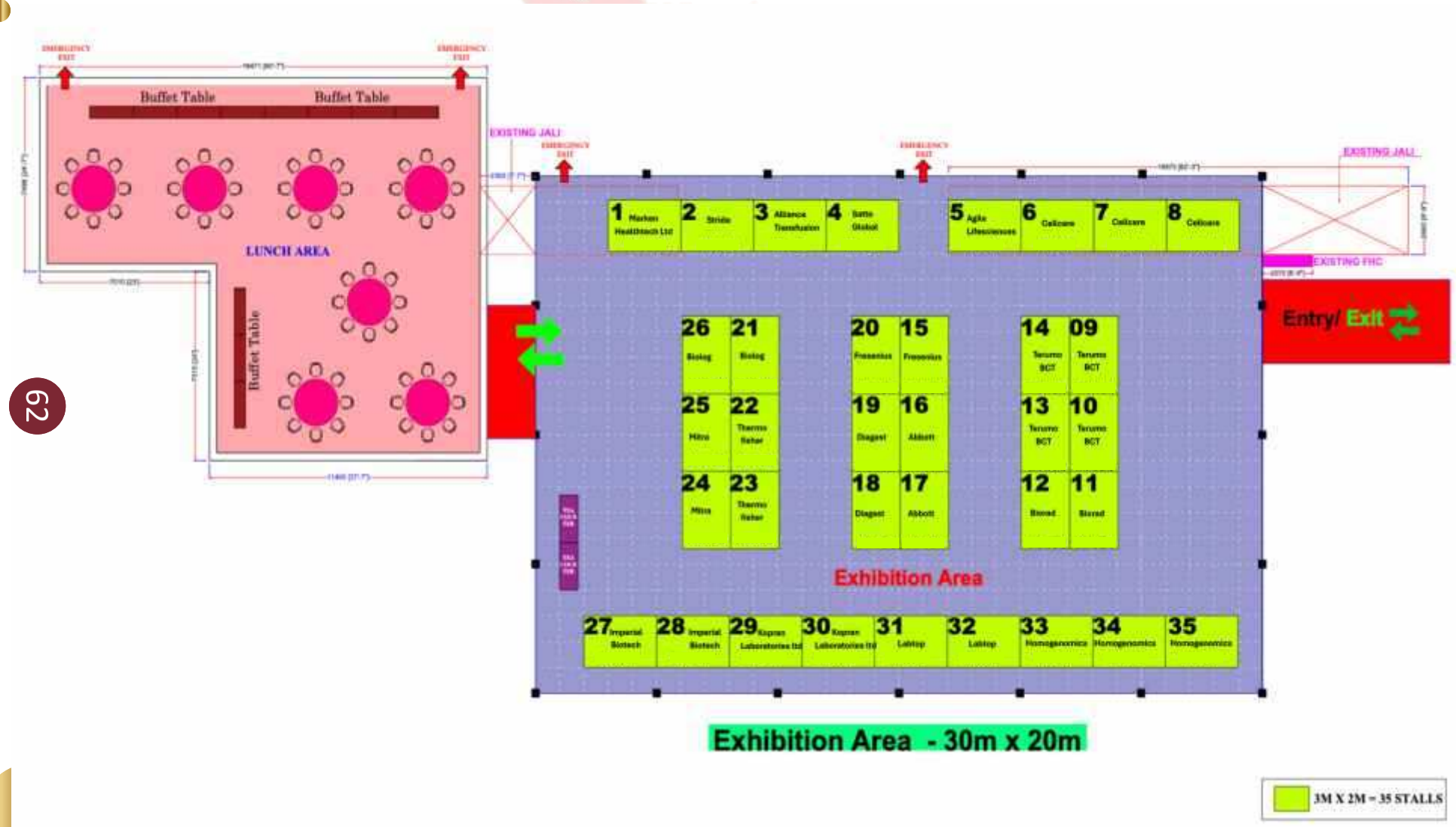
DAY 3 | 21ST SEPTEMBER 2025 | SUNDAY

	Dr J G Jolly (HALL A)			Dr Zarin Soli Bharucha (HALL B)			Mrs Kanta Saroop Krishen (HALL C)	
8:00 am-9 am						8:00 am- 9:00 am	PG QUIZ	
Session 25	Tiniest Transfusion: Biggest impact (Pediatric Transfusion)	Speakers	Session 26	Unifying elements	Speakers	Session 27	Hematopoietic Stem Cell Transplant-Hope on Ice: Banked today for a healed tomorrow	Speakers
9:00 am-10:40 am	Chairpersons:	Dr Anil Gupta, Dr Subhrat Chandra	9:00 am-10:40 am	Chairpersons:	Dr. S Subash, Dr. Pallavi P, Dr. Archana Solanki	9:00 am-10:40 am	Chairpersons:	Dr. Saptrushi Mandal, Dr. Mrinalini Chaturvedi
9:00 am-09:15 am	Transfusion in pediatric critical care unit.	Dr Bhaskar Saikia	9:00 am-09:15 am	Risk mitigation for incompatible transfusion	Dr. Abhinav Verma	9:00 am-09:15 am	HSCT donor selection and consenting in India	Dr. Sangeeta Agarwal
9:15 am-9:30 am	Role of transfusion specialist in supporting neonatal transfusion	Dr. Seema Dua	9:15 am-9:30 am	Challenges of immunization in repeated transfusions	Dr. Varun Capoor	9:15 am-9:30 am	Spectrum of HSCT: MRD,MUD,Cord and Haploidentical	Dr Anil Khetrapal
9:30 am-9:45 am	Current role of Exchange transfusions in Managing Neonatal Hyper bilirubinemia	Dr Lakhwinder Singh	9:30 am-9:45 am	Update on ASFA guidelines	Dr. Ashish Maheshwari	9:30 am-9:45 am	Role of HSCT in managing autoimmune diseases	Dr. Divya Doval
9:45 am-10:00 am	Managing hemophilia and inhibitors	Dr. Nita Radhakrishanan	9:45 am-10:00 am	Holding time for component preparation: what to choose 2 hours vs 24 hours?	Dr. Ashish Jain	9:45 am-10:00 am	Optimization of Stem Cell collection	Dr Snehal Majumdar
10:00 am -10:40	Panel: Pediatric hemovigilance	Moderator: Dr. Arun R. Panelist: Dr. Chaitanya Kumar,Dr. Dibyajyothi Sahoo, Dr Deepthi Krishna, Dr. S Aswin , Dr. Araveti Yashovardhan	10:00 am -10:40 am	Panel: How to Choose a NAT platform	Moderator : Dr Paula Saa . Panelist: Dr. Rajesh Sawant, Dr. Prashant Pandey, Dr. Rahul Katharia , Dr. Amardeep Pathak, Dr. Madhan Kumar, Dr. Dhyaneswar Patale, Dr Jed Gorlin	10:00 am -10:40 am	Graft Qality from difficult donor in HSCT	Moderator: Dr. Mitu Dogra. Panelist: Dr. Bhavana Arora, Dr. Ramesh Yadav, Dr. Uravshi Kotwal, Dr. Gunjan Bharadwaj, Dr Richa Gupta
10:40-11:00 am	TEA/COFFEE BREAK							
Session 28	From blueprints to footprints- Quality Management System		Session 29	Midas Touch:Cellular Renaissance (Cellular Therapy)	Speakers	Session 30	Voluntary Blood Donors	Speakers
11:00 am-12:30 pm	Chairpersons:	Dr Atul Mohan Kochar, Dr Anita Tendulkar, Dr. Harish Warbhe	11:00 am-12:30 pm	Chairpersons:	Dr. Vimarsh Raina, Dr. Anil Khetrapal	11:00 am-12:15 pm	Chairpersons:	Dr Yudhbir Singh, Mr. Satish Kumar, Dr Yazdi Italia
11:00 am-11:15 am	HIRA (Hazard Identification and Risk assessment)	Dr. Devesh Tiwari	11:00 am-11:20 am	CART therapy: Role in Transfusion Medicine	Dr. Priti Desai	11:00 am -11:15 am	Behind the vein: the pshycology of a motivated donor	Dr. Kusum Thakur
11:15 am-11:30 am	Near miss, big impacts: learning through real world data.	Dr. Prerna Mohan	11:20 am-11:40 am	NK cell based immunotherapies – the emerging hero?	Dr. Riyaz Ahmed	11:15 am-11:30 am	Success Storeis of VBD	Mr Amar Singh
11:30 am-11:45 am	Expectations and Reality Check – Quality Assurance in BTS.	Dr. Bhupender Rana	11:40 am-12:00 noon	Umbilical Cord blood banking: Where are we today?	Dr Mrinalini Chaturvedi	11:30 am-11:45 am	Success Storeis of VBD	Ms Vimla
11:45 am-12:30 pm	Panel: Monitoring of quality indicators	Moderator: Mr Satish Kumar Panelist: Dr. Prerna Mohan, Dr Prashant Agarwal, Dr Sangeeta Aggarwal, Dr Irfana Nikhat, Dr Indubala.	12:00 noon -12:20 pm	Standards & Accreditation for Cellular therapy Program	Dr. Shanshank Ojha	11:45 am-12:15 pm	**Panel :** Motivators, barriers and behavioural modifications for sustained VBD.	Moderator: Dr. Pratul Sinha Panelist: Dr. Anju Uppal,Dr. Purnima Rao, Dr. Vanashree Singh, Dr. Gajendra Singh, Dr. Manish Vidja, Dr Jhalak Patel
Session 31	State Reports -NBTC	Speakers	Session 32	Topic	Speakers	Session 33	PG QUIZ	Speaker
12:30 pm to 1.15 pm	Chairpersons:	Dr. Geeta Agarwal, Dr.Megha Pravin Khobragade, Dr.Krishan Kumar	12:30 pm to 1.15 pm	Hemovigilance	Dr Aseem Tiwari, Dr Shruthi Narayan	12.15 pm to 1.30 pm	Quiz Masters: Dr. Nippun Prinja, Dr.Hem Chandra Pandey, Dr. Lakhwinder Singh	
12:30 pm-12:45 pm	Best practises of West Bengal	Dr Abhijit Mandal	12:30 pm-12:45 pm	Hemovigilance program of India- Overview and Update	Dr. Akanksha Bisht			
12:45 pm-1:00 pm	Manipur and Maharashtra	State Representative	12:45 pm-1:00pm	National Recipient Hemovigilance Data Analysis	Dr Ravneet Kaur			
1:00 pm-1:15 pm	Andhra Pradesh	State Representative	1:00 pm-1:15 pm	National Donor Hemovigilance Data Analysis	Dr Gopal Pattidar			
1:15 pm onwards	Valeditory folllowed by lunch							



Exhibition Layout

50TH ANNUAL NATIONAL CONFERENCE OF ISBTI TRANSCON 2025,
DATE - 19TH-21ST SEPTEMBER025 | VENUE - GRAND HYATT GURGAON,



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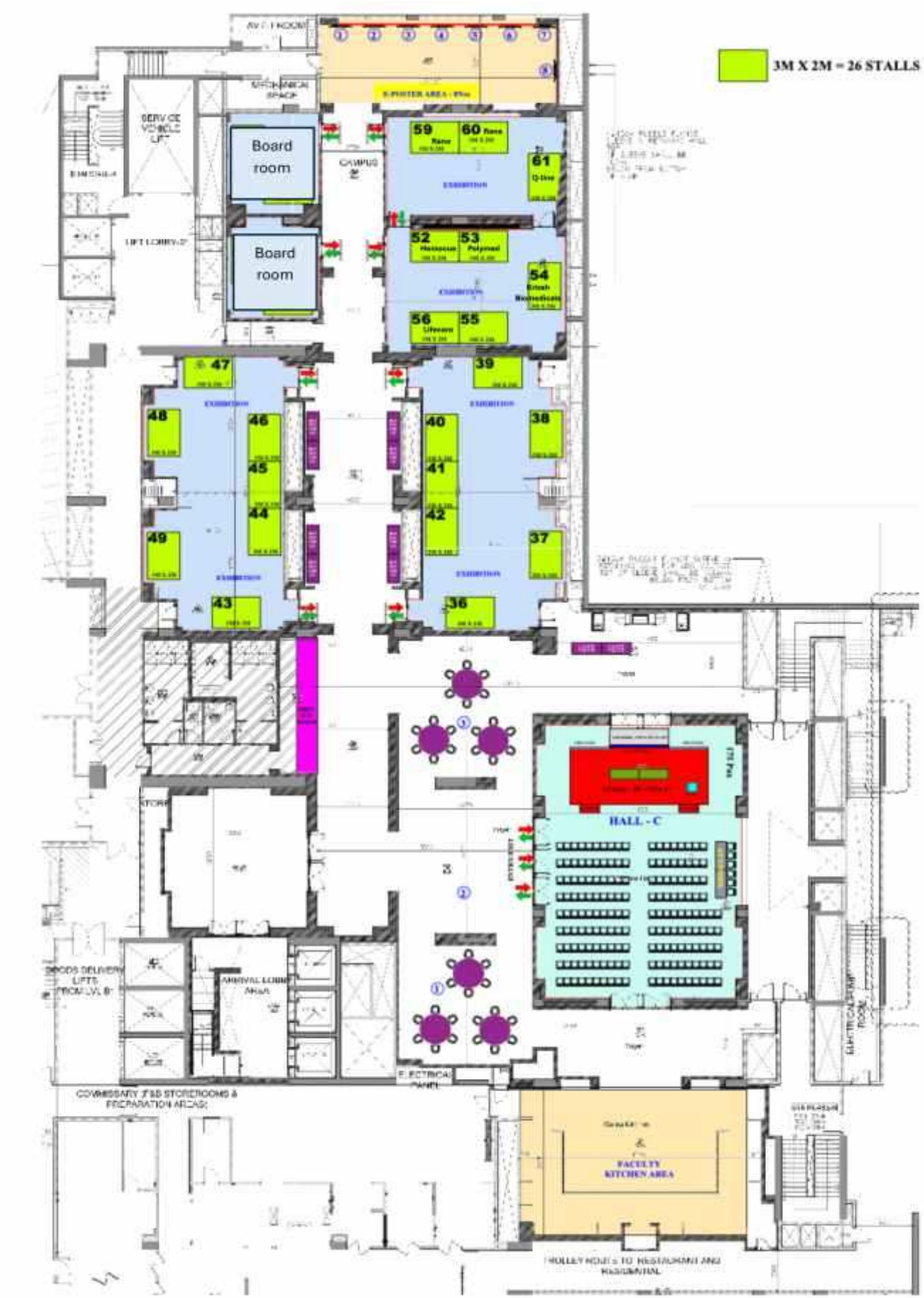

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Write-ups

Rare Blood Donor Programs

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Maintaining an adequate and reliable inventory of rare blood types remains one of the most persistent and critical challenges faced by transfusion services worldwide. Rare blood is generally defined as blood lacking high-frequency antigens or possessing uncommon antigen combinations that are absent in more than 99% of the general population. Although numerically small, the clinical need for such blood is disproportionately significant. It is indispensable for transfusion-dependent patients who develop multiple alloantibodies, individuals with rare phenotypes such as Bombay (Oh) or Rhnull, and those whose complex medical conditions necessitate extended antigen matching. In these situations, transfusion with non-compatible blood can result in severe hemolytic reactions, while failure to provide transfusion support may place patients at life-threatening risk.

Ensuring timely access to rare blood requires a carefully integrated strategy that spans donor identification, recruitment, retention, storage, and distribution. At the foundation of this effort is the identification of donors with rare phenotypes. Traditional serological methods, while essential, are limited by reagent availability and cannot always detect rare antigen variants. Over the past two decades, the advent of advanced molecular typing techniques—including high-throughput genotyping platforms—has revolutionized rare donor identification. These approaches enable large-scale screening for blood group alleles, allowing blood centers to map rare phenotypes more comprehensively than ever before. By combining molecular typing with serological testing, services can build robust donor databases that are essential for long-term planning.

Recruitment and retention of rare donors pose additional challenges. Since the prevalence of rare phenotypes is inherently low, targeted strategies are necessary. This includes reaching out to families of identified donors, engaging specific ethnic or geographic communities with higher prevalence of certain rare antigens, and building culturally sensitive recruitment campaigns. Once identified, rare donors must be nurtured through consistent communication, education about the importance of their contributions, and special recognition programs that reinforce their unique role in saving lives. Donor retention becomes particularly critical because lapses in donation may result in gaps that are not easily filled given the scarcity of replacements.

Equally important is the effective management of rare blood inventories. Traditional liquid storage is insufficient for rare units because of their short shelf life. Cryopreservation, using glycerolization and storage at ultra-low temperatures, provides a viable solution by extending red cell viability for up to 10 years or longer. This technique, while resource-intensive, allows blood services to build strategic reserves that can be mobilized during emergencies. Advances in cryopreservation protocols, automated deglycerolization systems, and quality control measures have made it increasingly feasible to maintain cryogenic inventories of rare blood, though the associated infrastructure and costs remain significant barriers, particularly in low- and middle-income countries.

Despite these technological advancements, logistical constraints remain a core challenge. Maintaining cryogenic storage requires continuous monitoring, highly trained personnel, and substantial financial investment. The rarity of suitable donors also creates supply-demand imbalances, especially in countries with limited population diversity or underdeveloped transfusion networks. Furthermore, the transport of rare blood across national borders is complicated by regulatory differences, customs clearance processes, and the need to preserve strict temperature control during shipment. These barriers highlight the necessity of structured international collaboration.

Global rare donor registries, such as those coordinated by the International Society of Blood Transfusion (ISBT), have proven to be vital mechanisms in addressing these gaps. By linking national registries, these networks facilitate rapid identification of compatible units worldwide and enable cross-border sharing of rare blood during urgent clinical scenarios. Examples from European and North American registries demonstrate that international cooperation,

supported by clear communication channels and harmonized regulatory frameworks, can markedly reduce delays in accessing rare units.

Best practices in rare blood inventory management emphasize a multi-pronged approach. At the donor level, they include systematic genotyping programs, targeted recruitment strategies, and strong retention initiatives. At the inventory level, they involve cryopreservation, meticulous record-keeping, and forecasting models that anticipate demand based on population demographics and clinical trends. At the collaborative level, participation in international registries and adherence to standardized communication protocols ensure that rare blood can be mobilized efficiently when local resources are insufficient.

In conclusion, while the challenge of rare blood supply is significant, it is not insurmountable. Advances in molecular typing, improvements in cryogenic storage, and the strengthening of international networks have all expanded the capacity of blood services to meet these needs. Nonetheless, persistent obstacles—including logistical complexity, high costs, and the finite nature of donor pools—require ongoing innovation and global cooperation. Future directions will likely involve integration of big data analytics to predict demand more accurately, expansion of genomic screening to map rare blood group variants in diverse populations, and broader engagement of international networks to ensure equitable access. Ultimately, safeguarding the availability of rare blood depends on a shared commitment to scientific innovation, coordinated management, and collective responsibility at both national and international levels.

Past Triumphs & Future Horizons
TRANSCON 2025

Optimizing Yield and Efficacy : Best Practice in Blood Component Preparation

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Introduction :

The blood transfusion services are an essential component of health-care system that works with a motive to ensure availability, accessibility, and adequacy to provide quality blood components. A unit of whole blood collected from a donor is a precious asset. A whole blood unit contains all the constituents such as red cells, white cells, platelets, and plasma with plasma proteins such as clotting factors and protective antibodies. In modern transfusion medicine the aim is to transfuse the patient with only the specific component for optimum clinical outcome.

At every step from donor screening to transfusion of blood unit required a quality management system (QMS) and any lowering in quality would reflect adversely on the final component. Profound theoretical and practical knowledge is required to ensure the optimal clinical use of blood and blood components (1,2).
To meet the diverse needs of patients and improve transfusion outcomes and safety, it is essential to adopt the latest strategies and best practices in blood component preparation. It has become a necessity to explores advanced techniques, tailoring blood components to patient needs, and quality management in blood component preparation.

Key Strategies for Optimal Yield & Efficacy:

- **Pre-storage Leukoreduction :**
  Reducing leukocytes (to $\leq 1\times10^6$ WBCs per unit) is critical to minimize adverse reactions—pre-storage filtration offers consistent RBC recovery and better quality control compared to bedside filtration.

- **Utilize Automation & Advanced Equipment :**
  Shift from manual to automated processing systems to boost yield, throughput, consistency, and reduce wastage.
  Carefully program centrifuges (adjusting acceleration, deceleration, RPM, RCF, etc.) to enhance platelet yield and minimize contamination and product defects.

- **Implement Quality Management & cGMP Systems :**
  Adhere to current Good Manufacturing Practices (cGMP), ensuring traceability, standardization, and safety in the donor-to-recipient chain.
  Employ robust Quality Management Systems (QMS), including SOPs, staff training, consistent QC, and continuous improvement measures

Continuous improvement strategies for blood component preparation :

Continuous improvement is essential for maintaining high standards in blood component preparation. Some of the key strategies for continuous improvement include:

- Regular review and update of SOPs and QMS
- Staff training and development programs
- Adoption of new technologies and innovations
- Benchmarking against industry standards and best practices

Conclusion :

Optimizing blood component preparation is crucial for meeting the diverse needs of patients and improving transfusion outcomes and safety. By adopting advanced techniques, tailoring blood components to patient needs, and implementing robust quality management systems, blood centres can ensure the highest standards of quality and safety.

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Platelet Utilization Audits

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Platelet component (PC) transfusions are essential for treating thrombocytopenia and bleeding, especially in oncology, surgery, and critical care. With high costs, short shelf-life, and potential risk, including transfusion reactions and risk of bacterial contamination, their use requires stringent monitoring. PC transfusions are considered (1) as more difficult to prescribe, monitor and follow up than the one of red blood cell concentrates (RBCs). According to hemovigilance records and to experience, PC transfusion carries more complications than RBC transfusion in the general population (2). Platelet utilization audits systematically assess whether transfusions align with clinical guidelines, safeguarding patient safety, conserving resources, and guiding improvements in practice.

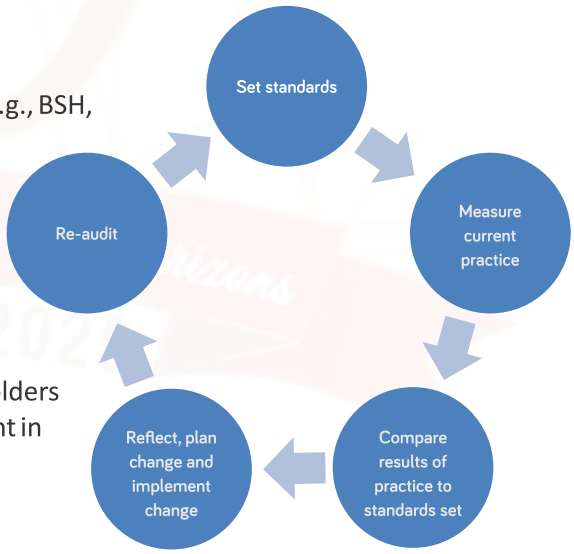
Purpose

1. Resource Stewardship: Platelets are among the most expensive and perishable blood components. Audits help curb waste and excessive costs.
2. Patient Safety: Unnecessary transfusions elevate the risk of adverse events. Ensuring appropriateness improves care quality.
3. Guideline Adherence: Audits assess compliance with established standards (e.g., AABB, BCSH, NICE), identifying where practice deviates.
4. Practice Variation: They reveal differences across specialties and institutions, driving targeted interventions.
5. Education & Quality Improvement: Findings often prompt training, policy updates, and system enhancements.

Audit Methodology

Typically, audits include:

1. Defining Standards : Local or National or international guidelines (e.g., BSH, AABB, NICE) may be used.
2. Data Collection : May be done retrospectively or prospectively. Details of transfusion episodes/ requisitions for select patient category over a defined period are noted.
3. Assessment : It includes reviewing for appropriateness of indications, pre-transfusion counts, documentation, and dose as per the criteria
4. Feedback Loop : It includes sharing of the audit results with stakeholders including clinicians. Suggesting remedial measures for improvement in practices, followed by educational or procedural changes.
5. Re-Audit : Monitoring improvements over time.



Observations from important studies

1. High rate of inappropriate transfusions: Various international studies (3-10) have reported inappropriate use in an average 20–50%of platelet transfusion episodes. Common causes included prophylactic use at high counts, double-unit use, and lack of documentation. In the UK Regional Audit (3), among 286platelet transfusion orders: 36.77% were found to be inappropriate. The major reason for PLT transfusion inappropriateness was transfusion above the recommended threshold. In an audit from a tertiary hospital in South Africa434% of transfusions did not align with local guidelines with 29.9% of transfusions administered to patients with platelet counts of $\geq 150 \times 10^9$/L.
2. Variability in practices among specialities: Hematology-oncology and internal medicine typically complied better. Surgical departments and operational areas had higher deviation rates compared to medical departments (4). Paediatrics and Internal Medicine were reported as having lowest and highest proportion of appropriateness by department at 63.9% and 86.8%, respectively as reported in the study from Italy (5).
3. Documentation Gaps: Many transfusion orders lack clear indications, undermining audit accuracy and

accountability. In the study from south Africa4 48.4% of the platelet transfusions lacked documented indication.

4. Variation in dosage: Higher dose of platelet transfusions have been reported to be inappropriate under most of the circumstances. In a Multihospital Variability Study from Canada involving 622 centers and 56,204 platelet transfusion
events: 93.6% were given 1 dose, 5.2% were given 2 dose and 1.2% were given >2 doses of platelet per transfusion. Inappropriate rates ranged up to 55.4% for counts above 50,000/µL7.2%. In the study by Liker et al (3), double units of Pcs were transfused in 36.7% of all PLT transfusions and 32.4% of them were considered inappropriate

Interventions to improve appropriate use

Re-audits have showed improvement in practices over the years, In UK, from an inappropriate rate of 45%(1681/3734) in 2007 (8) to a compliance rate of 92% (3046/3296) for a recent pre-transfusionplatelet count in the re-audit done in 2011 (9), other studies have also reported improvements after educational programs. Strathy et al (10) in an audit of platelet transfusion practices across 57 hospitals in Ontario have reported that PC transfusions ordered with either a pre-printed transfusion order set (odds ratio, 1.97) or technologist prospective screening (OR, 1.40) were more likely to be appropriate, indicating that implementation of prospective screening may prove to be effective in reducing the inappropriate PC transfusions.

Indian Scenario

In a prospective concurrent audit (11) of platelet transfusion practices from a tertiary care center in India, of 2,586 episodes, 93.6% were appropriate. Platelet count was missing in 6.4%, and dose was incorrect in 15.7%. Medicine and medical oncology departments had the highest level of appropriateness. In another retrospective audit (12) over a period of 06 months from North India involving transfusion of 5525 units of different types of platelet components in 853 recipients, authors have reported that 88% of the prophylactic platelet transfusions were found to be appropriate as per the recommended BCSH guildelines. Mahapatra et al (13) in their retrospective audit done over a period of six months from tertiary care center have reported that out of 3,757 units issued: 31% were inappropriate, 10.9% non–group-specific, and 1.99% wasted

Implications for platelet transfusion practices

1. Implement Clear Policies: Institutions must establish transfusion guidelines grounded in evidence (e.g., $<10\times10^9$/L prophylactic threshold).
2. Standardize documentation: Making indication, platelet count, and intended thresholds mandatory on forms supports appropriateness and audit utility.
3. Educate/ Sensitize clinicians: Targeted training, especially for surgical teams and trainees, encourages guideline adherence.
4. Use of Information Systems: Development and implementation of EMR alerts and audit dashboards can flag inappropriate orders and monitor improvement over time.
5. Conduct Regular Re-Audits: Audits should be cyclical to verify progress and reinforce best practices.

Future Directions

- Outcome-linked audits: Shifting the focus of audits from volume-based to impact-based, from prophylactic to therapeutic transfusion episodes including followup for response and further bleeding events, transfusion reactions, and outcomes may enhance the relevance of audits with better acceptability of the results among clinicians.
- Integration with Patient Blood Management (PBM): PBM frameworks promote judicious transfusion as part of comprehensive patient-centered strategies.
- National Benchmarking & sharing of data Data: Aggregated audit results inform regional standards and support benchmarking, as seen in Ontario and UK audits.
- Digital Tools for Resource Optimization: Machine learning models predicting platelet returns based on artificial intelligence can lower wastage and improve issuing policies—e.g., a model (14) reduced waste by 14% in simulation.

Conclusion

Platelet utilization audits are vital for ensuring effective, safe, and resource-aware transfusion practice. They consistently uncover significant rates of inappropriate use—ranging from documentation gaps to over-threshold prophylactic transfusions. Yet, when followed by structured feedback, education, and system changes, audits yield measurable

improvements. To elevate practice further, hospitals should embed audits within digital systems, align with PBM strategies, and pursue continuous improvement cycles.

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Role of Platelet Crossmatch in Platelet Refractoriness in Multi-Transfused Patients

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As we step into an era of precision-based medicine, the concepts of platelet transfusion therapy continue to develop. Platelets are crucial mediators of haemostasis, and they express immunogenic proteins unique to them or shared with other cells. **Platelet refractoriness**, the failure to achieve the expected rise in platelet count after transfusion, poses a barrier to effective therapy. This clinical challenge requires our collective expertise as transfusion medicine specialists, as it leads to **increased bleeding risk, longer hospital stays, higher costs, and poor clinical outcomes**. Differentiating platelet refractoriness from platelet alloimmunisation is important for diagnosis and management. **Alloimmunisation** is the development of alloantibodies against platelet antigens. Not all alloimmunized patients are refractory, and refractoriness can occur without alloimmunization. Platelets express **Human Leukocyte Antigens (HLA) and Human Platelet Antigens (HPA)**. Alloantibodies against platelet antigens can result in conditions such as Fetal-Neonatal Alloimmune Thrombocytopenia (FNAIT), Post-Transfusion Purpura (PTP), and platelet refractoriness. Blood group antigens (ABO, I, P) also play a role, particularly with high expresser phenotypes that accelerate platelet destruction. Refractoriness is diagnosed by post-transfusion platelet count increments. The corrected count increment (CCI) at one hour and 24 hours post-transfusion is a widely used measure; a **CCI <7500** indicates refractoriness, with early low CCI suggesting immune causes and delayed low CCI indicating non-immune mechanisms. About **30%** of cases involve **immune** causes (alloantibodies against HLA/HPA), while **70%** are **non-immune** (such as splenic sequestration, sepsis, bleeding, chemotherapy, GVHD, liver disease, drugs, and older platelets). **Immune platelet refractoriness** is a major challenge in haemato-oncology patients and those needing chronic transfusions, as **repeated exposure to donor antigens increases the risk of alloimmunization** against HLA class I and HPA antigens. These patients often have multiple transfusion requirements due to **chemotherapy-induced thrombocytopenia** or **bone marrow failure** due to underlying medical condition. Alloantibody formation leads to poor post-transfusion platelet increments, increasing bleeding complications. Platelet refractoriness is a multifactorial complication where early recognition, exclusion of non-immune causes, and tailored transfusion strategies are vital. Management strategies include **HLA-matched platelets, Antibody Specificity Prediction (ASP), and platelet crossmatching.** HLA-matching may require extensive multi-donor typing and searching, involve cross-reactive groups (CREGs) or epitope-based approaches. ASP broadens donor pools by avoiding mismatched HLA; however, both HLA-matching and ASP are ineffective against anti-HPA antibodies. The use of **platelet crossmatching** has emerged as an important tool in overcoming alloimmune platelet refractoriness, marking a paradigm shift in transfusion practice. Using platforms like **solid phase assays, modified capture ELISA, or flow cytometry**, the compatibility between donor platelets and recipient serum can be tested not only to diagnose refractoriness caused by **Anti-HLA and Anti-HPA** antibodies but also to provide compatible products. This approach has demonstrated significant improvements in transfusion outcomes.

A simple test like platelet crossmatch can assist in diagnosis and the allocation of compatible products for both Anti-HPA and Anti-HLA positive individuals, paving the way for personalised platelet therapy.

Case Based Approach To Less Recognised Coagulation and Platelet Function Disorders

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Evaluation of bleeding disorders in patients is common in clinical practice. The pathologist and the clinician are frequently asked to evaluate a bleeding patient, a patient with a suspected inherited bleeding disease (past/family history), pre-procedure who is likely to bleed (positive family history), incidental detection of an abnormal PT/PTT, negative history but unexposed patient before high-risk procedures like tonsillectomy or for monitoring of anticoagulation therapy for prevention and/or treatment of thrombosis.

Common causes for excessive bleeding include structural issues like trauma, surgical bleeding or bleeding varices, effects of therapeutic agents like anti-platelets and anticoagulants and bleeding in systemic diseases like DIC. Uncommon factors include congenital or acquired bleeding disorders.

Diagnosis of severe bleeding disorders is most often a straightforward exercise. However the diagnosis of mild bleeding disorders may be quite often challenging and these patients though they may not bleed in daily life, problems may occur after a haemostatic challenge.

Decisions on appropriate investigations need to consider that acquired coagulopathies from vitamin K deficiency (VKD), liver disease, and lupus anticoagulants (LAs) are far more prevalent than all inherited coagulation factor deficiencies combined. The testing strategy should consider the clinical context, bleeding history, medication use, pretest probability of an inherited or acquired bleeding disorder based on presenting issues (e.g., an asymptomatic laboratory test abnormality vs severe acquired bleeding with evidence of a coagulopathy), potential yields of investigations, laboratory test availability, and costs.

When working up a patient for a suspected bleeding diathesis the use of the screening tests as a group or “battery” is recommended. This information needs to be integrated to reach a final diagnosis.

In summary, effective diagnosis and treatment of bleeding disorders depends on the physician’s expertise in eliciting a detailed, specific history, in differentiating clinically whether the bleeding is due to vascular/platelet factor problems or is due to problems in the coagulation pathway, and in proper ordering and interpretation of laboratory tests to confirm the clinical suspicion. Each of these components by itself may be nonspecific and insensitive to be useful but when combined will lead to a high quality diagnosis. This talk is a case based approach to the diagnosis of some lesser recognized coagulopathies and their management.

Irradiation and Storage of Red Blood Cells

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Red blood cell transfusions are essential in the treatment of anemia triggered by various pathologies or due to haemorrhage caused by trauma or surgery . Globally, approximately 118.5 million units of whole blood were collected in 2024 of which 65% of blood transfusions in low-income countries were administered to children under 5 years of age while patients over 65 years comprised approximately 76% of transfusions in high-income countries. While millions of whole blood and red blood cellular products are transfused annually, red blood cell concentrates (RBCCs) are still the most commonly transfused component.

While there is extensive literature available regarding leucocyte reduced RBCC, there is less data available regarding the effects of gamma irradiation on prestorage leucocyte reduced red blood cellular concentrates. The American Food and Drug Association (FDA) recommends that a minimum of 75% recovery of transfused red blood cells must be present in the blood system 24 hours after transfusion. Gamma irradiation exacerbates the storage lesion and the increased potassium levels over and above those seen in nonirradiated red blood cellular products due to the seepage of lactate dehydrogenase and potassium ions caused by irradiation exposure have been of particular concern. Gamma irradiation is indicated when a patient is at risk of developing transfusion-associated graft versus host disease (TA-GVHD) from being exposed to red blood cell components containing viable lymphocytes via transfusion. TA-GVHD is a rare complication of transfusion and although it may be fatal, using gamma irradiation protects the vulnerable patients. The damaging effects of gamma irradiation on blood components are largely limited to red blood cells and do not significantly affect granulocyte and platelet function.
Despite reduced leucocyte concentration in the RBC units, a small amount of leucocytes remain in the pack and this usually does not pose a problem for patients with a healthy immune system unless they are receiving designated/directed donations. Red blood cellular products are irradiated to decrease the risk of transfusion-associated graft versus host disease (TA-GvHD).

TA-GvHD is a rare but fatal adverse transfusion reaction resulting from clonal proliferation and engraftment of viable donor T-lymphocytes and may occur in immunocompromised patients or in patients transfused with blood from donors who are homozygous for shared human leucocyte antigen (HLA) haplotypes. Gamma irradiation targets lymphocytic nucleic acids but also damages nonlymphoid cells in the process. There is a noticeable change in the properties of the RBC when they are irradiated. These alterations include lipid peroxidation due to reactive oxygen species (ROS), integrity of cell membrane is affected, seepage of potassium ions is accelerated, intracellular nucleotides are altered, and cell elasticity and deformability are decreased. The literature reports increased plasma potassium, lactate dehydrogenase, and haemoglobin concentrations in irradiated red blood cellular products. Due to the storage lesions occurring during irradiation, in vitro haemolysis increases and, consequently, when irradiated RBC is transfused, the in vivo recovery is decreased, but this is not regarded as being clinically significant unless patients present with renal failure or the onset of hyperkalaemia. It has been reported that children are more susceptible to cardiovascular pathology due to hyperkalaemia than adults. Neonatal hyperkalaemia may be prevented by using a cell saver to wash the irradiated RBC product for neonates undergoing cardiopulmonary bypass surgery. It is also recommended that neonates at risk of hyperkalaemia requiring intrauterine or exchange transfusions be transfused within 24 hours after irradiation of RBC. Gamma irradiation of products is recommended for intrauterine transfusion, exchange transfusions, transfusions of first-degree relatives, premature neonates weighing less than 1200 g, patients with congenital immunodeficiency pathologies such as DiGeorge syndrome, Wiskott-Aldrich syndrome, all recipients of allogeneic bone marrow transplants, those undergoing stem cell harvesting for later autologous reinfusion, and patients who have received aggressive chemotherapy. Currently, gamma irradiation is the endorsed method for the prevention of TA-GvHD.
The American FDA and the Canadian guidelines have stipulated that the maximum storage period for irradiated RBC is 28 days, while the Council of Europe recommends that irradiation of nonleucocyte reduced RBC should not be completed for

more than 14 days after donation and should not be stored for longer than 14 days after irradiation. Regarding irradiation dosage, the Council of Europe stipulates 25 Gy to 40 Gy on any given place on the bag, whereas the American FDA recommends not less than 15 Gy at any given place of the bag while 25 Gy must be delivered in the middle of the bag. South Africa abides by the guidelines stipulated by the Council of Europe regarding expiry of irradiated RBC, but the irradiation dosage is between 25 and 50 Gy where the centre of the container is targeted.

The available data on the effects of irradiated red blood cellular products is limited as few systematic studies have been done, quality control testing is not performed on these units, and there is a variety of available guidelines regarding irradiation. Therefore, irradiated RBC storage lesions cannot be predicted.

Change is Universally Acceptance for Better Tomorrow

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Transfusion medicine being broad speciality many attempts by various universities are been made to reach the perfection in teaching methodology for years across the world , but, still yet to reach the standardisation , simplification & specialisation in this particular field of medicine .

Attempts are been done enormously to make the students at UG & PG level to understand & dispense the necessity knowledge of blood products at right time for utilisation with least reaction & complications as an Adjuvant therapy by the clinicians in treating the cases & helping to save lives of needy patients.

A pilot study and assessment is been done from 2022-2023 for the UG students by the end of posting to the blood centre about improving the knowledge of Transfusion medicine by allocating feedback with few questionnaire , in which all the students did agree to have a special set of question paper specifically for transfusion medicine subject made compulsorily to attempt in separate secession to be answered during pathology paper will certainly help them in retaining the necessity knowledge about transfusion medicine also during practical's for 10 marks the exercise May be made compulsory , followed by 15days Blood centre postings during internship be made compulsory to all the students will enable them to gain & retail knowledge in how to recruit & motivate donors , as without understanding this part blood centres cannot proceed further treating the patient.

With this aspect , it become very much necessity we should start educating about the importance of becoming a donor from primary class at early age itself to know the blood & blood components in our body & it's functional part , how to improve over it naturally in our daily diet , so that at right age they become a proud blood donors to be healthy in avoiding & Lessing the risk of heart attacks & stroke to great extent for themselves & helping the needy in saving many lives at one time their blood donation, by this we can notice the major role of preparing & educating the general public regarding goodness of blood donation is completed.

Next , at the time of starting UG & PG in any speciality if induction classes are made compulsory to attend & during internship if compulsory postings are made we can notice enormous changes in treating the patient.

Hence , by taking right step of educating the general public at school level will enormously save not only our time of drawing attention & importance of becoming Blood Donor at basic level , so that enabling the transfusion specialist in handling the daily new challenges in their field in reaching perfection & accuracy.

Standardising teaching in Transfusion Medicine is brought by adopting diverse teaching methodologies which involves

1. Theory and Foundation knowledge by -Lecturers , Case studies , Massive open online courses (MOOC's).
2. Practical and Simulation based learning by In person simulation , standardised patient scenarios.
3. Patient Cantered Approaches by Patient Blood Management (PBM)
4. Saftey & Compliance.
   Hemovigilance training, regulatory requirements . 5.Interactive & Problem based learning.
6. Implementation Strategies by
   By Modular & incremental training , Technical Manuals , Global Collaboration.
   Benefits of Standardised Teaching enables us in improved patient outcome, enhanced Safety & global competency.

Scroll, Post, Save Lives : The Role of Social Media in Transfusion Medicine

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In today's hyper-connected world, the scroll of a thumb can ripple into life-saving action. For transfusion medicine (TM) professionals, social media is no longer just about engagement — it is an indispensable tool to mobilize donors, educate the public, and strengthen the healthcare ecosystem. Platforms like X (Twitter), Instagram, WhatsApp, and Facebook are redefining how we communicate about blood donation and transfusion services.

From Awareness to Action: Why Social Media Matters

The challenge of ensuring a steady, safe, and voluntary blood supply has always been central to TM. Traditional outreach methods — posters, camps, and awareness talks — remain important, but digital platforms amplify the message at unprecedented speed and scale. A WhatsApp message can fill an urgent platelet requirement in minutes; an Instagram story can inspire hundreds to register as first-time donors.

Examples abound in India. Most recently, following the **tragic Ahmedabad plane crash of 2025**, thousands of donors responded within hours after hospitals and citizens amplified urgent appeals on social media platforms — a testament to how quickly digital communities can mobilize when lives hang in the balance.

Skills for the Digital Age in TM

Harnessing social media effectively requires more than just posting updates. Professionals in transfusion medicine need to cultivate a toolkit of modern skills:

- **Digital literacy:** Understanding platforms, algorithms, and reach dynamics.
- **Content creation:** Designing posts, infographics, and short videos that are both accurate and appealing.
- **Engagement management:** Monitoring responses, answering questions, and building trust through dialogue.
- **Analytics awareness:** Tracking reach, shares, and conversions to assess real impact.
- **Data interpretation:** Tracking analytics to understand which messages translate into donor action.
- **Crisis communication:** Crafting clear, calm, and factual updates during emergencies like outbreaks or shortages.

These skills transform TM professionals from passive observers into active digital health communicators.

AI: A Powerful Ally — but Not a Replacement

The emergence of Artificial Intelligence (AI) offers additional tools for amplifying social media campaigns. AI can automate routine tasks like scheduling posts, flagging misinformation, and analyzing public sentiment. Natural language models can help draft multilingual appeals within minutes, while predictive analytics can anticipate seasonal shortages and suggest campaign timing.

Yet, even as technology evolves, one truth remains: the **human touch cannot be replaced**. A chatbot may answer FAQs, but it cannot replicate the empathy of a counsellor reassuring a first-time donor. The best results come when technology and human communication combine — multiplying efficiency while retaining compassion.
Communication: The Lifeblood of Social Media Campaigning

At its core, social media is a communication tool. And communication is not just about broadcasting — it is about connecting, engaging, and inspiring. Key principles include the **3C Rule**: Clarity, Compassion, Credibility.

Beyond facts and figures, effective social media in transfusion medicine depends on human-centered communication — qualities like storytelling, listening, and emotional intelligence transform campaigns from simple announcements into conversations that inspire trust, empathy, and action!

- **Storytelling:** Storytelling is particularly powerful. Narratives of donors and recipients transform numbers into human connection. A "unit of blood" becomes a tale of hope, courage, and survival.
- **Listening:** Monitoring donor feedback, responding respectfully, and adapting messages.
- **Emotional Intelligence (EI):** Using empathy to design messages that inspire action. Gratitude posts, inspiring stories, or urgent appeals during crises resonate more deeply than generic awareness slogans.

For transfusion professionals, mastering this art is no longer optional.

Ethics and Guidelines: Navigating the Digital Landscape

With power comes responsibility. Using social media in healthcare requires strict adherence to ethical boundaries. Globally, bodies like the WHO, EU (GDPR/AI Act), and the US FDA provide guidance on digital health communication, while in India, the **Digital Personal Data Protection (DPDP) Act 2023 and National Medical Commission (NMC) regulations** mandate confidentiality, consent, and professional conduct online.

Responsible digital citizenship safeguards both patients and the credibility of our profession. Adhering to these guardrails ensures that trust remains intact.

From Posts to Impact: Measuring Success

Ultimately, the goal is not just likes or shares but lives saved. The true measure of digital campaigns lies in their offline impact. Did a WhatsApp broadcast translate into 50 platelet donors? Did an Instagram reel inspire more youth to pledge regular donations? By closing the loop — sharing results, celebrating milestones, and acknowledging donors — we reinforce a cycle of trust and participation.

Conclusion: A Call to Action

"Scroll, Post, Save Lives" is more than a catchy phrase. It is an urgent reminder that in the digital era, each of us carries the ability to influence real-world outcomes with our online actions. When combined with scientific expertise, ethical responsibility, and human empathy, it transforms into one of the most powerful tools available to transfusion medicine today.

As transfusion medicine professionals, let us not underestimate the power of a well-crafted post, a timely reply, or a heartfelt story. Because behind every scroll lies a potential donor. Behind every post lies a life waiting to be saved.

Improving Transfusion Efficacy in Sickle Cell Patients By Adopting A Precision Medicine Approach

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Sickle cell anemia (SCA), the major form of sickle cell disease (SCD), is a severe inherited hemoglobinopathy driven by the presence of mutant hemoglobin S (HbS). This variant leads to erythrocyte deformation, vaso-occlusion, chronic hemolysis, and a wide spectrum of multi-organ complications. Notably, the clinical course and severity of SCA vary widely among individuals due to underlying genetic heterogeneity, environmental factors, and the presence of comorbidities. Such diversity makes SCA an ideal candidate for precision medicine approaches that seek to tailor transfusion therapies and other interventions to optimize efficacy, minimize risks, and improve patient outcomes.

Transfusion Therapy in Sickle Cell Disease

Transfusion therapy is a fundamental component in the management of SCD. Its applications include stroke prevention, treatment of acute chest syndrome, anemia management, and perioperative care. Despite its benefits, transfusion therapy is associated with significant complications such as iron overload, alloimmunization, and hemolytic reactions, highlighting the need for careful individualized management. By integrating genomic, proteomic, biomarker, and clinical data, precision medicine provides promising avenues to enhance transfusion outcomes through refined risk stratification, customized antigen matching, and selection of appropriate transfusion modalities.

Genetic Determinants and Clinical Stratification

The primary genetic determinant of SCD phenotype and transfusion responsiveness is the β-globin genotype, with HbSS and HbSC being most prevalent. Despite the clinical differences between these genotypes, most treatment strategies remain uniform due to limited genotype-specific guidelines. Additional genetic modifiers, such as co-inherited α-thalassemia and loci that increase fetal hemoglobin (HbF) levels, exert modest influences on disease severity and transfusion requirements, but their use in guiding individual therapies is still largely experimental.

Advances in Transfusion Guidelines and Modalities

Current transfusion guidelines advocate for extended red cell antigen profiling and prophylactic antigen matching for Rh (C/c, E/e) and Kell antigens. These measures are crucial for reducing the risk of alloimmunization in chronically transfused SCD patients. Among transfusion modalities, automated red cell exchange (RCE) has emerged as the preferred technique over simple transfusion, offering more rapid HbS reduction and minimizing iron overload. Further innovations, such as isovolemic hemodilution RCE, help decrease red cell unit utilization while optimizing patient safety.

Emerging Precision Therapies and Future Directions

The introduction of targeted therapies—including crizanlizumab (anti-P-selectin), voxelotor (polymerization inhibitor), and L-glutamine—augments the precision medicine toolkit in SCD transfusion management. These agents foster a more personalized approach by addressing specific pathophysiological mechanisms in individual patients. Although gene therapy holds immense curative potential, its clinical deployment is constrained by accessibility and cost barriers.

Iron Overload Screening and Management

The evolution of precision medicine in transfusion also touches upon the monitoring and management of iron overload. Magnetic resonance imaging (MRI)-based quantification of liver iron provides more accurate guidance for iron chelation compared to serum ferritin, particularly in patients undergoing chronic transfusion. Cardiac iron assessment by MRI is

reserved for patients at higher risk, reinforcing a tailored monitoring approach to optimize therapy and resource allocation.

Barriers to Implementation in Precision Transfusion

Despite these advancements, several obstacles hinder the widespread implementation of precision medicine in SCD transfusion. Challenges include the difficulty in defining reliable prognostic groups, limited therapeutic options, socioeconomic disparities, and variability in healthcare infrastructure—issues especially pronounced in resource-limited regions. In addition, the high cost and technical demands of comprehensive genomic and proteomic profiling pose further limitations.

Ongoing Research and Data Integration

Recent advances in bone marrow and cellular therapy offer hope for curative treatment of sickle cell anemia. Allogeneic stem cell transplants have become safer and more accessible, especially with innovations like haploidentical (half-matched) transplants and improved immunosuppression, now available to more adults and children. Alongside this, gene therapy—including FDA-approved methods like CRISPR (Casgevy) and lentiviral vectors (Lyfgenia)—allow a patient's own stem cells to be genetically modified to produce healthy hemoglobin, eliminating symptoms for many recipients. Major hurdles include high cost, risk of complications such as secondary cancers, and limited availability in many regions, though accessibility is slowly improving. Ongoing research integrates data from genomics, biomarkers, and computational modeling to better predict outcomes, personalize therapy, and expand these curative options to broader patient populations.

Conclusion

Precision medicine for transfusion in sickle cell anemia represents a transformative approach aiming for enhanced efficacy and safety in this critical therapy. Although currently most visible in targeted transfusion strategies for stroke prevention, future progress will increasingly depend on advanced patient phenotyping, new drug therapies, and the assimilation of diverse biological information. The ultimate objective is to achieve adaptive, personalized transfusion regimens that sustainably advance the quality of life and long-term outcomes of those living with SCD worldwide.

Past Challenges & Future Horizons
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Non- HLA Antibodies : Are They Significant?

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Historically, HLA donor specific antibodies (DSAs) have been the primary focus in understanding antibody mediated rejection (AMR). However, an ever-growing number of graft rejection and/or failure even with good HLA matches and in the absence of detectable HLA-DSA points to a more complex immunological landscape and have highlighted an important role of non-HLA antigens in influencing allograft immunity. A broad panel of antibodies toward multiple endothelial and nonendothelial antigen targets besides HLA antigens have been found to be associated with allograft dysfunction and injury. A debate exists about whether these detectable non-HLA antibodies are the cause of antibody-mediated injury or only innocent bystanders. It is pertinent to explore the intricate role of non-HLA antibodies in transplant outcomes and uncover new avenues for improving patient lives.

Vasculature is at the interface of the recipient immune system and the transplanted organ. A substantial proportion of the non-HLA antibodies reported to mediate renal rejection recognize autoantigens expressed by endothelial cells. Autoantibody production in the transplant setting depends on multiple factors. Organ transplant inevitably involves varying levels of surgical trauma, tissue damage and ischemia reperfusion injury (IRI), all of which expose cryptic self-antigens. A triad of alloimmunity, autoimmunity and tissue injury can likely trigger the perfect storm for allograft dysfunction and reduced survival.

The list of non-HLA antigens that have been implicated in graft rejection in different types of organ transplantation has already grown long. Of these, the Major Histocompatibility Complex class I chain-related molecule A (MICA) is one of the most polymorphic and extensively studied non-HLA antigenic targets especially in the kidney transplantation. Humoral response to MICA antigens has repeatedly been associated with lower graft survival and an increased risk of acute and chronic rejection following kidney, heart and liver transplantation with few studies showing conflicting results. Although there are clear indications of MICA antibodies being associated with adverse graft out-come. A large retrospective multicentre trial by Carapito et al not only validates multiple previous studies but also provides important clarity about the role of MICA independent of HLA. A definitive consensus on widespread MICA genotyping and DSA testing is yet to be arrived. Evidence is building that MICA antigen should no longer be ignored in solid organ transplantation. Future pre-transplant workup will likely include MICA genotyping.

In the seminal work published more than a decade ago in NEJM by Dragun et al demonstrated the pathogenic effect of Angiotensin II type-1 receptor (AT1R). Passive transfer of AT1R antibodies in a rat model of kidney transplant accentuated allograft vascular injury showing the pathogenic effect of these autoantibodies. Subsequently, several studies have reported the association of AT1R antibodies with AMR. Philogene et al showed that greater number of renal transplant recipients who are retransplanted, male and younger individuals and those with FSGS at the time of transplantation were positive for AT1R and anti-endothelial cell antibodies (AECA). The Herbert group demonstrated that endothelial injury triggers perlecan (a heparan sulfate proteoglycan) proteolysis and production of LG3, truncated c-terminal fragment. They measured LG3 in the recipients with acute vascular rejection and observed elevated circulating levels compared with normal function & tubulointerstitial rejection.

Non-HLA antibodies represent a crucial, yet often overlooked, layer of immunological complexity in solid organ transplantation. Their significance is increasingly being recognized for several key reasons e.g. unexplained rejection in absence of HLA antibodies, distinct pathology from that of HLA antibodies and its synergistic impact with HLA antibodies leading to more aggressive and treatment-resistant outcomes. Both alloimmune and autoimmune mechanisms impact graft outcome and may be synergistic to each other. Understanding pathogenic mechanisms require further investigation

so as to enhance the development of targeted therapy. There is a lack of standardized detection assays for non-HLA antibodies except those against MICA antibodies. Therefore, development of coherent screening assays for the detection of clinically relevant multiple non-HLA antibodies simultaneously is the need of the hour. Comprehensive diagnostic assessment strategies focusing on both HLA-DSA and non-HLA antibody responses could substantially improve immunological risk stratification before transplantation.

Virtual VS Physical Cross Matches - The UPS, The Downs & Possible Solutions

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Background:

Crossmatch testing remains central to pre-transplant immunological risk assessment. Traditional physical crossmatches (CDC and Flow Cytometry Crossmatch) directly evaluate recipient sera against donor lymphocytes and have been the gold standard for avoiding hyperacute rejection since Patel & Terasaki's landmark observations. However, they are time-consuming, cell-dependent, and may extend cold ischemia time. The evolution of virtual crossmatch (VXM)—based on high-resolution HLA typing and solid-phase antibody assays—has transformed allocation by offering rapid, highly sensitive prediction of donor-recipient compatibility.

The Ups:

VXM offers major advantages: reduction of cold ischemia time, improved access to transplantation for sensitized patients, and high concordance with physical crossmatch outcomes. It streamlines allocation logistics, especially in regional/national sharing, and facilitates inclusion of marginal and distant donor organs without compromising outcomes. Physical assays still provide direct functional relevance, detecting complement-fixing antibodies and non-HLA antibodies, thereby maintaining their value in ambiguous or high-risk cases.

The Downs:

Limitations exist for both strategies. Physical crossmatches depend on viable cells, are operator-dependent (CDCXM), and may lack sensitivity for low-level or class II antibodies. VXMs, while sensitive, may "over-call" risk: Luminex single antigen bead assays detect low-level or denatured antigen antibodies of uncertain clinical significance, generating false positives and unnecessary organ declines. Discordances (positive PXM/negative VXM and vice versa) often arise from incomplete donor typing, shared epitope phenomena, prozone effects, or presence of non-HLA antibodies. The lack of global standardization for mean fluorescence intensity (MFI) cut-offs further complicates interpretation.

Possible Solutions:

Emerging strategies aim to bridge the gap between sensitivity and clinical relevance. These include:

- **Refined antibody characterization** (C1q/C3d binding, IgG subclass assays) to distinguish complement-fixing from clinically irrelevant antibodies.
- **Epitope/eplet analysis and algorithms (HLAMatchmaker, PIRCHE)** to contextualize SAB results and improve prediction of rejection risk.
- **High-resolution and extended HLA typing** (including DQA/DPA/DPB loci) to reduce false-negative VXMs.
- **Integrated approaches:** using VXM for rapid allocation and reserving physical crossmatches for highly sensitized patients, ambiguous antibody patterns, or when novel antibodies are suspected.
- **Digital and web-based platforms** to minimize human error and accelerate interpretation of complex antibody profiles.

Conclusion:

Neither virtual nor physical crossmatch alone is flawless. Optimal practice lies in combining the speed and sensitivity of VXM with the biological validation of physical assays, tailored to patient risk profiles. Future directions—including epitope-based risk stratification, AI-driven predictive models, and standardized global cut-offs—promise to harmonize these tools into a robust, patient-centric crossmatch strategy.

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E-learning Modules? Collaborative Modules with Hematology, Critical Care, Pathology, and Obstetrics

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Introduction

E-learning has transformed medical education by offering flexible, interactive, and accessible platforms for knowledge acquisition. In specialties such as Haematology, Critical Care, Pathology, and Obstetrics, where multidisciplinary coordination is crucial, e-learning modules provide an ideal approach to unify perspectives and enhance clinical decision-making. These modules, delivered through Learning Management Systems (LMS), incorporate lectures, case-based learning, flowcharts, and laboratory images to ensure learners gain both theoretical and practical skills. They are especially suited for postgraduate medical students and healthcare professionals engaged in continuing education.

Core Modules

Haematology

Haematology modules provide the fundamental basis of transfusion medicine. These cover blood components, compatibility testing, crossmatching, and transfusion reactions. Advanced topics include management of autoimmune hemolytic anemia, chronic transfusion protocols in thalassemia and sickle cell disease, iron overload monitoring, and molecular blood group typing. By blending laboratory concepts with bedside practice, learners acquire both theoretical knowledge and applied clinical decision-making skills.

Critical Care

Critical care modules focus on high-acuity scenarios where rapid transfusion decisions are essential. Massive transfusion protocols, disseminated intravascular coagulation, and thrombocytopenia in ICU settings are core themes. Learners explore the role of viscoelastic testing such as thromboelastography (TEG) and rotational thromboelastometry (ROTEM) in guiding transfusion. Interdisciplinary simulations prepare clinicians for real-world emergencies such as trauma-induced hemorrhage or sepsis-associated coagulopathy.

Pathology

Pathology-driven modules emphasize the diagnostic arm of transfusion medicine. These include the Coombs test, antibody screening and identification, and pre-transfusion laboratory workflows. Hemovigilance and quality assurance protocols are highlighted to demonstrate how pathology safeguards patient outcomes. Learners engage with laboratory case scenarios that show how blood bank practices directly impact the safety and effectiveness of transfusion in critical and obstetric settings.

Obstetrics

Obstetric haematology is one of the cornerstones of these collaborative modules, focusing on conditions unique to pregnancy and the peripartum period. Topics include postpartum hemorrhage, anemia in pregnancy, alloimmunization, and hemolytic disease of the fetus and newborn (HDFN). Through real-life case studies, the modules highlight multidisciplinary protocols involving obstetricians, haematologists, and intensivists. Learners are guided through blood product selection, risk stratification, and the coordination required during obstetric emergencies such as massive hemorrhage or HELLP syndrome.

Conclusion

Each module follows a structured approach with clear objectives, interactive case discussions, multimedia content, assessments, and key takeaways. By focusing on the four pillars—Obstetrics, Haematology, Pathology, and Critical Care—these e-learning modules provide a comprehensive and clinically relevant curriculum. The collaborative design ensures that learners not only gain knowledge but also develop the teamwork and decision-making skills needed to manage complex transfusion-related scenarios. These polished, interactive modules will enhance training, improve patient safety, and prepare medical professionals for current and future challenges in their fields.

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Red Cell Exchange Transfusion : Indications and Challenges

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Red blood cell (RBC) exchange transfusion is a procedure that removes a patient's abnormal or damaged red blood cells and replaces them with healthy donor red blood cells. It is indicated for certain hematologic and infectious diseases but faces challenges related to safety, logistics and cost. The primary goal of RBC exchange is to rapidly reduce the level of defective red blood cells, lower blood viscosity and improve oxygen delivery.

It is particularly effective for conditions where a rapid reduction of abnormal or infected cells is critical. Sickle cell disease (SCD) is the most frequent indication, RBC exchange is used for both acute and chronic management of severe SCD. Important indications as per American Society For Apheresis (ASFA) Journal of Clinical Apheresis 2023 are : Category I a) Acute Sickle Cell Disease: Acute Stroke b) Non Acute Sickle Cell Disease: Stroke Prophylaxis Category II a) Acute Sickle Cell Disease: Acute chest syndrome b) Non Acute Sickle Cell Disease: Pregnancy c) Non Acute Sickle Cell Disease: Recurrent vaso-occlusive crises Category III a) Acute Sickle Cell Disease: Other complications b) Non Acute Sickle Cell Disease: Pre-operative management c) Severe Malaria Few Challenges for a RBCx : 1) Underutilization of the Procedure: Healthcare providers may not consider therapeutic red cell exchange as a viable treatment option for certain conditions. This could result in patients not receiving the most effective treatment for their specific medical condition 2) Delayed or Inadequate Treatment: A lack of awareness may lead to delays in initiating therapeutic red cell exchange for patients who could benefit from it. In some cases, alternative and less effective treatments may be used instead. 3) Equipment concerns: The availability and maintenance of such equipment can be a limiting factor, especially in resource-limited settings. Experience In IMS and SUM Hospital since last 4 years: Total Exchange Transfusions for Sickle Cell Hemoglobinopathies- 127 Automated Red Cell Exchanges/aRBCx (Erythrocytapheresis)- 77, Manual Exchange Transfusions- 50 For comparison, In manual RBC Exchange and automated RBC Exchange transfusions, avg % of Pre HbS and Post HbS were 64.4, 47,5 and 79.4, 26 respectively. Except one patient who developed alloimmunisation at the time of procedure, no patient developed alloantibody formation post 72 hrs of procedures. A total of 77 aRBCx were done, out of which 54 were males and 23 were females. All the patients were provided with ABO specific/compatible, Rh and Kell phenotype matched, HbS negative, antigen negative, AHG crossmatched PRBC units. As per ASFA 2023 categories for therapeutic apheresis and turn around time for therapeutic apheresis , total aRBCx done under Cat III ,Cat II, Cat I were 69, 06 and 02 respectively. Emergent (within 8 hrs), Urgent (within 48hrs) and Routine type of a RBCx (within one week) were 04 ,14 and 59 respectively as per institutional protocol. The FCR (fraction cell remaining) ranged from 23 to 55 with an average FCR of 40.05. Automated red cell exchange done in patients with severe ACS (acute chest syndrome) proved to be a lifesaving modality with rapid reversal of symptoms. aRBCx performed for acute stroke in urgency in SCD were also associated with significant clinical improvement. One 19 y/f primi gravida with sickle cell hepatopathy with foetal distress who underwent one cycle of emergent aRBCx following which there was successful delivery of a female child of 1.9 kg birth weight by LSCS who cried immediately after birth. Patients who have undergone different surgical procedures like avascular necrosis of hip planned for THR (total hip replacement), cholelithiasis for Lap cholecystectomy, planned total knee replacement after one cycle of aRBCx, there were no complications during surgery, postoperative period was uneventful, they were discharged in haemodynamically stable conditions on 6th to 7th postop days. There were no complications reported during or within 24 hrs of completion of procedures due to vascular access, due to replacement fluid (compatible PRBC) or due to procedure except in one patient in primi gravida with 33 weeks of gestational age where there was fluctuations in vital parameters within 10 min to start of the procedure which were managed effectivdely that was followed by completion of procedure uneventfully. SUMMARY So to summarize, erythrocytapheresis (Automated Red Cell Exchange) is a safe intervention with low alloimmunisation rates and no risk of iron overloading with rapid reduction of HbS in a short time, can be life saving in some situations and can be considered as an essential component of any specialist service looking after patients especially SCD, setting up an apheresis unit though requires investment in equipments and staffs, however it is cost effective intervention as it reduces the need for iron chelation drugs, also in reducing the number of episodes of emergency hospital attendance.

Achievements of Blood Transfusion Services

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Blood Transfusion Services (BTS) are a cornerstone of public health, ensuring timely access to safe and quality blood. Over the years, BTS in India has grown into a regulated, efficient, and people-focused system, shaped by policies, standards, donor engagement, technology, and capacity building.

Policy Milestones

The transformation of BTS began in 1996 with a ban on professional blood donation, mandatory licensing of all blood banks, and the creation of the National and State Blood Transfusion Councils (NBTC and SBTCs). These steps strengthened governance and oversight.

The National Blood Policy (2002) provided a framework for adequate and safe supplies. The National Plasma Policy (2014) guided rational use of plasma and plasma-derived medicines. The Blood Donor Counselling Module (2016) and the DoPT order (2017 onwards) granting special casual leave to government employees further encouraged voluntary donation.

Mandatory screening of every blood unit for five transfusion-transmissible infections—HIV/AIDS, Hepatitis B, Hepatitis C, Syphilis, and Malaria—remains a critical safeguard for transfusion safety.

Standards and Quality

BTS emphasizes uniform standards. The second edition of NBTC Standards for Blood Centres (2022) and the third edition of the Transfusion Medicine Technical Manual (2023) provided detailed operational and clinical guidance.

The External Quality Assessment Scheme (EQAS), implemented with institutions such as CMC Vellore, Santokba Durlabhji Memorial Hospital, and the Indian Red Cross Society, established monitoring systems for testing quality. In 2025, Operational Guidelines for EQAS were issued, supported by workshops in Vellore to prepare for phased implementation.

Training and Capacity Building

Capacity building has been central to BTS. In 2024, region-wise Training of Trainers (ToT) programmes were organized for counsellors, medical officers, and laboratory technicians, with about 200 participants each.

In 2025, the NBTC Regional Training Programme for Nurses in Mumbai trained 34 nurses from seven States and one Union Territory. The programme combined lectures, group activities, and demonstrations to strengthen practical skills.

Donor Mobilization and Awareness

Progress towards 100% voluntary blood donation remains a priority. Nationwide awareness campaigns, donation camps, and observance of World Blood Donor Day (14 June) and National Voluntary Blood Donation Day (1 October) have mobilized large numbers of donors.
In 2023, donation camps were held at institutions such as Hindu College, New Delhi. On 1 October 2024, the Pan-India NGO Conclave at Jaipur brought together 120 NGOs to strengthen voluntary donation efforts and showcase IEC materials. The Voluntary Blood Donation Guidelines released in February 2025 reaffirmed this commitment.

Awareness programmes at the National Science Centre, New Delhi (May–June 2025) and Meghadoot Bhawan (July 2025) promoted participation among youth, officials, and the public, highlighting the benefits and safety of donation.

Technology and Digital Transformation

Technology has modernized BTS operations. The e-RaktKosh portal connects blood centres, donors, and donation camps. By enabling real-time tracking of availability, it has improved transparency, accountability, and equitable access.

National Conclaves and Reviews

To review progress and share best practices, BTS has convened national workshops and meetings. The National Workshop on Blood Safety Roadmap (2022), the Annual Action Plan Review Meeting at Indore (January 2025), and the National Conclave on Blood Practices & Transfusion Services at Kochi (February 2025) provided platforms for discussions on donor retention, transfusion safety, and innovation. At the Kochi Conclave, high-performing blood centres were felicitated, promoting recognition and peer learning.

Expanding Horizons

By mid-2025, BTS had significantly expanded its network, with thousands of registered centres and component separation units on the e-RaktKosh portal. Year-wise data show steady growth in both supply and safety.

The country's annual blood requirement is about 14.6 million units. In 2024, a total of 1,46,01,147 units were collected—15% higher than the 1,26,95,363 units in 2023. Voluntary donation now accounts for about 70%. Around 72% of centres are equipped with blood component separation units (BCSUs), improving access to specific components. Expansion of Nucleic Acid Testing is under way, with facilities at key institutes of National Importance and leading state institutions; nearly half of states now have at least one government NAT-equipped centre.

Collaboration with the National Viral Hepatitis Control Programme has enabled early identification and management of Hepatitis B and C among donors, enhancing both donor and recipient safety.

Conclusion

The achievements of Blood Transfusion Services in India reflect nearly three decades of consistent reforms and innovation. From banning professional donations in 1996 to introducing digital platforms and EQAS in 2025, every milestone has advanced the vision of universal access to safe blood through 100% voluntary donation.

BTS has shown that effective policies, rigorous standards, training, digital innovation, and community participation together form the backbone of a safe and efficient transfusion system. These achievements provide a strong foundation for the future, ensuring that safe, voluntary, and timely blood continues to serve as a lifeline for patients across the country.

From Whole To Wise : Clinical Excellence Through Component Use

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The shift from whole blood transfusion to evidence-based component therapy represents one of the most transformative milestones in transfusion medicine. This evolution, grounded in the principles of patient blood management, emphasizes targeted use of red cells, platelets, and plasma to meet specific clinical needs—improving outcomes, conserving resources, and reducing complications.

Component therapy has replaced the outdated “one-size-fits-all” approach with precise, patient-centered transfusion practices. By enabling clinicians to deliver only what is necessary, it enhances efficacy and minimizes risks such as volume overload and unnecessary exposure to donor antigens.

A key advancement supporting this practice is universal leukoreduction. Removing leukocytes from blood components reduces febrile non-hemolytic reactions, alloimmunization, and the transmission of leukotropic viruses, while limiting immunomodulatory effects in vulnerable patients, such as those with cancer or undergoing transplantation.

Today, component-based transfusion underpins modern care in oncology, surgery, trauma, obstetrics, and critical care—aligning with global safety standards and ethical imperatives to optimize every donor contribution.

The journey “from whole to wise” reflects more than technological progress; it represents a commitment to safety, sustainability, and clinical excellence. As these strategies continue to integrate with patient blood management programs, they will shape a future of safer, smarter, and more individualized transfusion care.

Specialty Clinics in Transfusion Medicine (TM)

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Background:

The blood transfusion service in India collects over 14 million units annually from more than 4000 licensed blood centers nationwide. Blood and its components transfusion are an essential part of any health care delivery. There is a significant progress in the blood transfusion services in India for the last two decades since the introduction of specialised post-graduate MD course in Transfusion Medicine (TM) from 1989-1990. Presently about 80 institutions in India are running this educational program (MD/DNB/Diploma) with an annual seat intake over 220 students. (1) TM is an independent clinical broad specialty (2) in India, which is otherwise a subspecialty of disciplines viz. Haematology, Internal Medicine or Pathology in the rest of the world.

Annual national demand for 15 million blood components for routine use, which needed a participation of over 3 per 1000 eligible voluntary blood donors. (3) There is an increasing burden of poorly controlled hemoglobinopathy patients who are primarily dependent on conc. red cells components as their most affordable and only therapeutic option.

Apheresis blood component collections and the therapeutic procedures are done by TM specialists in any developed blood centre. However, a very limited concrete data is available related to their services to develop the organ-transplantation program. (4)

To monitor and generate evidence-based recommendations in minimizing the adverse events of blood transfusion, the National Hemovigilance program was established on December 10, 2012. (5) The nomenclature of blood banks was now replaced to blood centre by the Central Drugs Standard Control organization (CDSCO), the national regulatory authority, for drug under the Ministry of Health and family welfare. Presently there are more than 22 blood components which are licensed in India and in future the blood centres have the potential to generate many newer generations of blood components. (6)

Objectives:

Transfusion services in the coming years need more clinical case-based approach and active involvement to explore:

a. Pre-operative anemia and hemoglobinopathy control
b. Patient blood management (PBM)
c. Rational use of blood components
d. Donor care and services
e. Early diagnosis and management of antenatal complications of alloimmunization
f. Blood and blood components are biotherapeutic agents that have potential for tissue regeneration and healing
g. Exploring hemovigilance and delayed adverse events
h. Research and development of new technology

How to develop the specialty clinic in TM?

The teaching departments of Transfusion Medicine should develop its own specialty clinic for patients that require special transfusion related services viz; multi-transfusion dependent patients of hemoglobinopathy, oncology, nephrology or allied specialties. Blood donors deferred due to several reasons, patients undergoing solid organ / stem cell transplants, antenatal mothers, polycythemia, therapeutic procedures and anemia constitute another major component of their patient services.(7)

The NMC curriculum of Transfusion Medicine emphasizes the importance of Specialty clinics (SAF-B), however the initiation from the concerned post-graduate (PG) teaching institutions is still minimal. After being an independent broad specialty for 3 decades in the country, there is a need for development of the own specialty clinic rather than inter-departmental postings of PG students.

Specialty clinics of TM – a single centre experience at Government Medical College, Kolkata over 3 years

The TM clinic of the department was established on 6th April 2022, at the request of the Government of West Bengal, Dept. of Health and Family Welfare to establish a 10-bed indoor facility to support primarily critically ill patients of hemoglobinopathy (HFW-27025/9/2021-SBC SEC(SAPCS)-Dept. of H&FW/ Thal/ 499 Date.09.06.2021). The clinic runs every Wednesday with an annual turnover of 4000 patients. There is ever increasing number of new patients (Figure 1). The facility clinic has 2 rooms for patient examination and 1 room for phlebotomy. Only equipment engaged is a 3-part cell-counter. Two (2) medical technologists are posted on the OPD day. The indoor beds are 15 in total, 10 female and 5 male (Figure 2). The average bed occupancy is 60% throughout the week

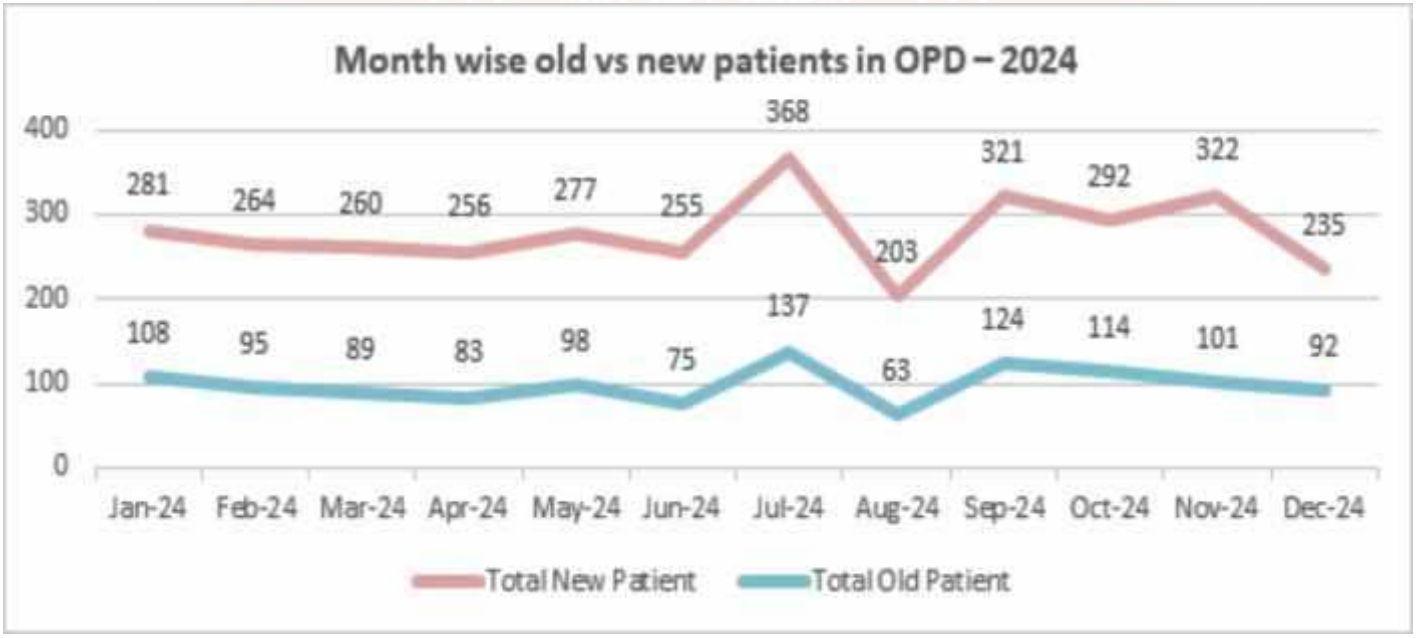

Figure 1

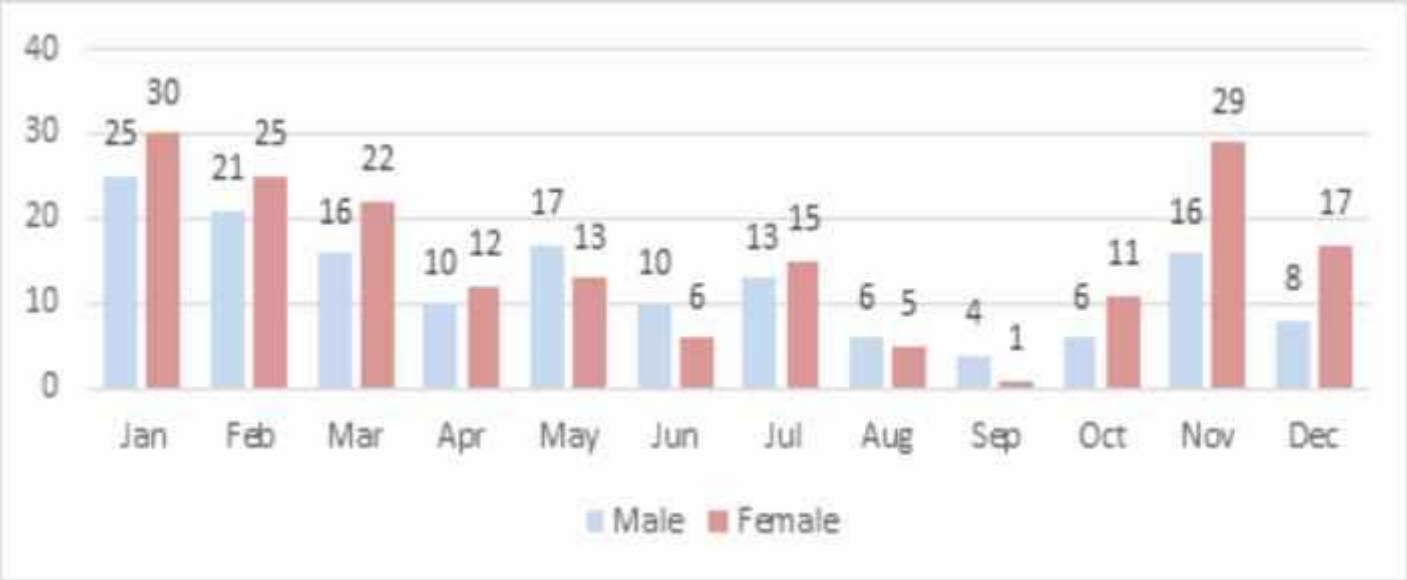

Figure 2. Month wise male vs female indoor admissions 2024

Insights:

1. Thalassemia and hemoglobinopathy affect the blood transfusion services of the state of West Bengal with a huge demand for red cell concentrates (35% of total annual blood collection to meet the need of 18000 patients who are dependent)
2. The inadequate and unsafe transfusions lead to complications like growth failure, extramedullary hematopoiesis, endocrinopathy and over 20 % sero-reactivity
3. Transfusion needs and minimization of adverse events is possible with proper transfusion protocol, judicious use of Hb-F inducers and splenectomy
4. Hb-F inducers are well tolerated with very rare serious events. Only 1 patient reported with toxic epidermal necrolysis on thalidomide, managed successfully with i.v. steroids and conservative treatment.
5. Alloimmunized patients require continuous monitoring during and post-transfusion
6. Only day-care facility may be too inadequate, patients require strict iron chelation and multidisciplinary approach
7. Blood donors who are deferred otherwise unlikely to wait in the busy OPD hours
8. Polycythemia patients are regular at OPD attendees (4-5 patients on OPD) and phlebotomy management is easier
9. The examination and assessment of transplant work-up and therapeutic procedures are fast, and patients are handled under direct supervision
10. More bed-side review and clinical involvement of resident doctors, relieves the monotony of work at blood centre premises
11. The role of non-invasive hemoglobinometer reduces phlebotomy and iatrogenic blood loss and an alternative in Hb-measurement [7]

Conclusion:

Setting up TM clinic at every PG teaching department is essential for more expansion of the services and create interest among the PG residents. Blood component transfusion at times becomes a hazardous intervention if it's complicated with alloimmunization and recurrent transfusion reactions. Such patients require strict medical supervision. Our 3 years of experience in running a TM clinic at a government medical college with TM indoor admissions has shown some valuable insights to support the hemoglobinopathy patients. It initiated an awareness among the inter-specialty doctors to refer their patients directly for specialist assessment and transfusion support.

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Towards Universal Blood and Blood Components - Future Perspective

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Blood transfusion is a cornerstone of modern medicine, sustaining patients in surgery, oncology, trauma, hematological disorders, and critical care. Yet, its practice remains constrained by major challenges: dependence on voluntary donors, limited shelf life of blood components, antigenic incompatibility, and risks of alloimmunization or adverse transfusion reactions. These limitations have driven one of the most ambitious goals in transfusion medicine—achieving universal blood and blood components that can be safely and effectively used for all patients, irrespective of blood group.

One of the most promising strategies involves enzymatic antigen conversion, where specific glycosidases can cleave A and B antigens from red cell membranes, producing universally compatible O-type red cells. Parallel advances in gene editing technologies, including CRISPR-Cas9 applied to stem cell–derived red cells, have enabled the development of "antigen-null" red blood cells. These engineered cells could serve as an inexhaustible supply of universal donor red cells, transforming transfusion practice and addressing shortages worldwide.

In addition, research into plasma and platelet substitutes is reshaping the field. Solvent-detergent treated plasma reduces risks of incompatibility and pathogen transmission. Platelet additive solutions and pathogen-reduction systems extend shelf life while enhancing safety. Synthetic and recombinant products, including hemoglobin-based oxygen carriers and engineered platelets, are being actively explored to complement or replace donor-derived components.

At the same time, the integration of artificial intelligence (AI) and bioinformatics is revolutionizing transfusion safety and personalization. Next-generation sequencing (NGS) and genomic databases allow precise prediction of blood group phenotypes, including rare variants. When coupled with AI-driven algorithms, these resources enable advanced donor-recipient matching, alloimmunization risk assessment, and personalized transfusion strategies. Furthermore, AI-supported data analytics can optimize blood bank inventory, forecast demand, and enhance surveillance of transfusion-related events in real time.

Together, these advances point towards a future where transfusion medicine is not only safer and more efficient but also universal and personalized. The convergence of biotechnology, gene editing, and AI-driven informatics has brought the concept of universal blood from aspiration to near-clinical reality. While significant challenges remain—including high production costs, ethical considerations, and the need for regulatory frameworks—the progress made thus far underscores a transformative shift. Universal blood and blood components, empowered by AI and genomics, represent a decisive step towards achieving equitable, safe, and error-free transfusion therapy worldwide.

Digital Blood Bank : If Banks Can Go Digital, Why Not Blood Banks?

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The past two decades have seen banks transform from paper-heavy institutions into sleek, digital platforms where customers manage money through mobile phones, ATMs, and online portals. This raises an important question for healthcare: if banks can go digital, why not blood banks? Blood banks, now known as blood centres, are the lifeline of hospitals, ensuring safe collection, testing, storage, and transfusion of blood and its components. Yet many still rely heavily on paper registers, handwritten labels, and manual processes. Moving toward a digital blood bank is not only desirable but essential, as it can minimize errors, improve efficiency, and ultimately save more lives.

One of the earliest steps in digitization has been the adoption of barcoding. Each donor and blood unit is assigned a barcode that links to their record in the blood bank information system (BBIS). This prevents duplication, allows accurate labelling of components, and ensures traceability from donor to recipient. Scanning barcodes at each stage: collection, separation, testing, storage, and issue, creates a digital trail, reducing the chance of mix-ups. While barcoding has significantly improved safety, it still requires line-of-sight scanning and one-at-a-time processing. This is where RFID (Radio Frequency Identification) is emerging as a next-level tool, enabling wireless, bulk scanning and real-time inventory management. Just as banking evolved from passbooks to digital wallets, blood banks are moving from barcodes to RFID tags for faster, smarter, and safer operations.

At the heart of this transformation is the BBIS, which acts like the "core banking system" of transfusion medicine. Every donor registration, blood collection, component preparation, and issue is logged electronically in BBIS. The system integrates with donor management portals, where individuals can register, schedule donations, and receive reminders through SMS or apps. Once blood is collected, it undergoes component preparation, where whole blood is separated into red cells, plasma, platelets, and cryoprecipitate. Each component is barcoded or RFID-tagged and logged into the BBIS with its specific storage and expiry details.

Digitization also extends to equipment interfacing. Modern testing instruments for blood grouping, infectious disease screening, and crossmatching can be directly connected to BBIS. Results are transmitted automatically from the analyzer to the software, eliminating manual entry and minimizing transcription errors. This is especially important during crossmatching, the process of ensuring compatibility between donor blood and a patient's sample. Digital interfacing reduces turnaround time, ensures accuracy, and provides built-in checks against issuing incompatible units.

An important safety feature supported by digital systems is the delta check. This function automatically compares current test results with previous records to detect unusual changes. For example, if a patient's blood group result is inconsistent with past data, the system flags the discrepancy for review. Similarly, if a donor's hemoglobin or serology result deviates unexpectedly, the delta check prevents errors from going unnoticed. These safeguards are difficult to implement in manual systems but become routine in a digital blood bank.

The cumulative effect of these digital advances is a sharp reduction in human error. Mislabelling, misplaced units, and transcription mistakes are among the leading causes of transfusion errors. By automating data flow from donor registration to final transfusion, digitization minimizes manual handling and ensures traceability at every step. Inventory management also becomes more efficient, as the BBIS can generate real-time reports of available stock, upcoming expiries, and usage trends. This helps hospitals prepare for emergencies and reduces wastage of precious blood units.

The transition from paper registers to digital records mirrors the journey banks took toward digitization. Just as ATMs, net banking, and UPI transformed customer experience, tools like barcoding, RFID, equipment interfacing, and BBIS are

redefining blood banking. The ultimate goal is a “Smart Blood Bank”, one that integrates donor management, component preparation, testing, crossmatching, storage, and issue into a seamless, error-resistant system.

The future promises even more integration. RFID will work hand-in-hand with RFID-enabled refrigerators to monitor storage conditions, while AI-driven analytics will predict demand and guide donor recruitment. Block-chain may be used to create tamper-proof transfusion records, ensuring absolute traceability from donor to recipient. Mobile platforms will further connect donors, patients, and hospitals in real time.

In conclusion, digitization is not a luxury but a necessity for modern blood centres. With technologies such as barcoding, BBIS, equipment interfacing, RFID, and delta checks, the blood centre of the future will be safer, faster, and more reliable. If banks could embrace digital change and transform into customer-centric organizations, blood centres can and must do the same for the benefit of patients whose lives depend on timely and error-free transfusion services.

Red Cell Transfusion in Patients with Traumatic Brain Injury : Precision or Presumption

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Traumatic brain injury (TBI0 is the commonest cause of mortality among the trauma patients. While primary injury to the brain is the major reason for mortality and morbidity, anemia in these patients can further impair the oxygen delivery to the brain causing secondary injuries and affect the overall outcome. In healthy individuals with anemia, oxygen delivery to the brain is compensated by increasing the cerebral blood flow (CBF) through the increase in cardiac output and vasodilation of cerebral arterioles until a critical Hb threshold of 5-6 g/dl is reached. As the compensatory mechanisms in TBI are affected, anemia in these critically ill can exacerbate secondary brain injuries and are often linked to poorer functional outcomes and increased mortality.

The goal of RBC transfusion in TBI patients is to improve oxygen delivery to the brain. As presumed, several studies have reported beneficial effects of higher Hb threshold of 10g/dl than the restrictive transfusion strategy (Hb <7 g/dl). While most of these studies were observational in nature, they also had several inherent biases. The results of these studies were not replicated or proved otherwise, indicating towards use of lower threshold for RBC transfusion among patients with TBI. Randomized clinical trials (RCT) viz TRAIN, HEMOTION and SaHARA trial also show conflicting evidence with regards to the Hb threshold and their outcomes measures as short-term, long-term mortality and functional outcomes. Systematic reviews in this regard also fail to provide strong evidence to alter the course of RBC transfusion in TBI.

Current critical care guidelines recommend a restrictive transfusion strategy, with a Hb threshold of ≥7 g/dl. Some guidelines from trauma and critical care specialties recommend a target Hb of 7-9 g/dl for TBI patients, while others, such as the Brain Trauma Foundation Guidelines, make no specific recommendation. Newer evidence in this regard has shown that neuromonitoring systems to assess physiological indicators like Cerebral Tissue Oxygenation (PbtO2), Mixed Venous Oxygenation Saturation (SvO2), Cerebrovascular Pressure Reactivity, Intracranial Pressure (ICP) monitoring, Cerebral Microdialysis (CMD), etc. can be used for individualizing the RBC transfusion in TBI.

To conclude, the purpose of RBC transfusion is to avoid secondary brain injuries in patients with traumatic brain injuries. The evidence for optimal threshold is unclear, despite several RCT comparing restrictive (Hb<7g/dl) vs liberal (Hb<10g/dl) transfusion strategies. There is upcoming role of neuromonitoring systems for optimizing the transfusion in TBI patients and future studies comparing restrictive transfusion therapy to the transfusion based on neuromonitoring systems are needed for optimizing the RBC transfusion in these patients.

Neurology Meets Apheresis : The Role of TPE in Neuroimmune Disorders

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Therapeutic plasma exchange (TPE) has evolved as a cornerstone in the management of several neurological diseases, particularly those mediated by pathogenic autoantibodies or immune complexes. By physically removing circulating antibodies, complement components, and inflammatory mediators, TPE directly addresses the immunopathogenesis of these disorders. Over the last few decades, evidence-based guidelines such as those from the American Society for Apheresis (ASFA) have clarified the role of TPE in both routine and potential indications within neurology.

Established Indications

1. Guillain–Barré Syndrome (GBS)

   Acute inflammatory demyelinating polyneuropathy remains one of the most widely recognized neurological indications for TPE. Randomized controlled trials have consistently demonstrated that TPE is as effective as intravenous immunoglobulin (IVIG) in hastening recovery, especially in patients with moderate to severe weakness. By removing circulating antibodies against peripheral nerve components, TPE improves outcomes and reduces the need for prolonged ventilatory support. ASFA designates GBS as a Category I, Grade 1A indication, underscoring its frontline role.

2. Chronic Inflammatory Demyelinating Polyneuropathy (CIDP)

   In chronic forms of immune-mediated neuropathy such as CIDP, TPE offers substantial benefit. Evidence suggests it is effective as both a first-line and adjunct therapy, particularly in relapsing or treatment-resistant cases. By improving nerve conduction and clinical function, TPE provides meaningful improvement in quality of life. This is supported by strong evidence, making CIDP another Category I indication with Grade 1B evidence.

3. Myasthenia Gravis

   For acute worsening of myasthenia gravis, including myasthenic crisis, TPE is a well-established therapy. Its rapid onset of action, achieved by clearing acetylcholine receptor and related antibodies, makes it particularly valuable in emergency settings or as preoperative optimization before thymectomy. Several clinical trials validate its efficacy, leading to a Category I, Grade 1A–1B recommendation.

4. PANDAS (Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections)

   In children presenting with acute neuropsychiatric exacerbations linked to group A streptococcal infection, TPE is recognized as Category I. By removing cross-reactive antineuronal antibodies, TPE can ameliorate severe obsessive–compulsive symptoms or movement disorders. While the evidence is not as extensive as for GBS or myasthenia, controlled studies support its role with Grade 1B evidence.

5. Neuromyelitis Optica Spectrum Disorder (NMOSD)

   In contrast to multiple sclerosis, NMOSD is strongly antibody-driven, most notably by aquaporin-4 antibodies. For acute, steroid-refractory relapses, TPE has proven valuable in improving neurological recovery. It is classified as Category II, Grade 1B.

6. Acute Disseminated Encephalomyelitis (ADEM)

ADEM is an inflammatory demyelinating condition often following infections or vaccinations. In severe steroid-resistant cases, TPE has been used successfully to reverse encephalopathy and neurological deficits. It is a Category II indication with moderate (Grade 2B) evidence.

7. NMDAR Encephalitis
N-methyl-D-aspartate receptor (NMDAR) antibody encephalitis is increasingly recognized in young patients, often associated with psychiatric manifestations, seizures, and movement disorders. TPE helps by rapidly clearing pathogenic antibodies, particularly when initiated early alongside immunotherapy. ASFA now categorizes this as Category I, with Grade 1C evidence.

Potential and Investigational Indications

Beyond established uses, therapeutic plasma exchange (TPE) has been explored in several rare or experimental neurological disorders. Sydenham's chorea, a post-streptococcal autoimmune movement disorder, may theoretically benefit from TPE in severe or refractory cases, though steroids remain primary therapy.
In Alzheimer's disease, the AMBAR trial examined TPE based on amyloid clearance and albumin replacement hypotheses, but results were inconsistent, limiting its role to research. Paraneoplastic syndromes (e.g., anti-Hu, anti-Yo) may show partial improvement when TPE is combined with tumor-directed therapy and immunosuppression. Opsoclonus–myoclonus syndrome and stiff-person syndrome are other antibody-mediated conditions where TPE offers modest or adjunctive benefit, particularly in treatment-resistant cases. Overall, evidence remains limited, and TPE is considered experimental outside classical autoimmune encephalitis.

Conclusion

Therapeutic plasma exchange represents a vital therapeutic modality in neurology, with a well-established role in antibody-mediated disorders such as GBS, CIDP, myasthenia gravis, and NMDAR encephalitis. For conditions like NMOSD and ADEM, it serves as an important second-line option, particularly in steroid-refractory cases. Beyond these, its role in rarer or investigational indications continues to be explored, ranging from paraneoplastic syndromes to Alzheimer's disease. The common thread is the potential of TPE to modify immune responses by directly eliminating pathogenic circulating factors.

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AI in Transfusion Medicine : Practical Applications

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Introduction: Artificial intelligence (AI) and Machine Learning (ML) are reshaping transfusion medicine by enabling data driven solutions that enhance efficiency, safety, and patient outcomes. Advanced computational tools can now integrate diverse datasets, from laboratory parameters and electronic health records (EHRs) to supply chain metrics, creating opportunities to transform transfusion practices. Some of such AI/ML tools have been discussed in brief here.

Predictive Analytics and Demand Forecasting: Accurate prediction of blood demand remains a persistent challenge for transfusion services. Traditional approaches rely on historical averages and manual adjustments, which often fail to capture real time fluctuations caused by seasonal trends, epidemics, or sudden surgical caseloads. ML models, particularly ensemble methods like Random Forest, gradient boosting, and neural networks, have demonstrated robust performance in forecasting blood utilization. When applied to large hospital datasets, these models can identify high-risk patients likely to require transfusion, predict component-specific demand (RBCs, platelets, plasma), and support strategic planning for donor mobilization and inventory management. Such forecasting reduces both shortages and wastage, ensuring availability of blood products when needed.

RAG-Based Models for Clinical Optimization: Retrieval Augmented Generation(RAG) models dynamically retrieve updated, domain-specific knowledge bases including guidelines, laboratory policies and patient records, before generating outputs. In transfusion medicine, RAG models can support by providing guideline based transfusion thresholds tailored to patient comorbidities and can offer decision support during complex surgical or critical care scenarios where bleeding risk is dynamic. It can also suggest alternatives to transfusion, in accordance with patient blood management (PBM) tenets. RAG approaches reduce the risk of outdated or "hallucinated" recommendations by anchoring AI outputs in curated evidence. This contextualization enhances safety, fosters trust, and ensures alignment with institutional and regulatory standards.

AI Agents and Model Context Protocol: The next frontier in AI for transfusion medicine involves architectures that move beyond static prediction to dynamic, interactive systems. Model Context Protocols (MCPs) are designed to standardize how models access, exchange, and interpret context across healthcare ecosystems. In transfusion services, MCPs could allow seamless integration of laboratory information systems (LIS), donor management software, EHRs, and inventory databases into a unified decision support framework.

AI agents, operating on top of MCPs, represent autonomous but supervised digital assistants that can orchestrate workflows. It can continuously monitor inventory and alert blood banks to potential shortages, automatically schedule donor recall drives based on predicted demand and generate patient specific transfusion plans that are dynamically updated as new data (hemoglobin, coagulation profile, intraoperative blood loss) becomes available. When combined with federated learning, such systems could leverage data across institutions without compromising patient privacy, creating globally generalizable models.

Conclusion: AI has moved from theoretical concepts to practical applications in transfusion medicine. As these technologies evolve, they must be implemented responsibly, balancing innovation with ethics, transparency, and equity. The future vision can be an AI augmented transfusion service that ensures timely, precise, and personalized blood management, thereby optimizing patient outcomes and best use of available resources.

Gene Therapy - Principles & Applications

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Gene, the basic physical and functional unit of inheritance, composed of specific sequences of DNA that provide blue prints for making proteins. The Human Genome Project, declare that humans have between 20,000 and 25,000 genes. Gene therapy is an emerging approach to treat, cure or prevent genetic based diseases by correction of defective genes. The first successful nuclear gene transfer, approved by the National Institutes of Health, was performed in May 1989.

Two types of gene therapy.

1. Germline gene therapy (GGT): Gene therapy directed at reproductive cells (sperm and eggs) or preimplantation embryos. GGT will not only prevent passage of genetic disease to a child, but to all future generations.
2. Somatic gene therapy: Unlike germline therapy, somatic gene therapy involves the insertion of therapeutic DNA into body cells, such as fibroblasts, myoblasts, epithelial cells, endothelial cells, nervous cells etc.

Methods For Administering Gene Therapy

1. Ex-vivo gene therapy- patient tissue is removed by a surgical biopsy, cells are isolated and grown in culture, genes are inserted into these cells using retroviral vectors, and the cells are then re-implanted in the body by autologous transplantation. But technically difficult to maintain and transduce fully functional cells ex vivo
2. In-vivo gene therapy, in which DNA or viral vectors are administered directly to patients. But Exposes patient to larger dose of viral vector and vector may cause unforeseen effects on unintended target cell.

Gene Therapy Strategies:

Gene Addition, Gene Inhibition/ Gene knockdown, Gene Editing and Gene Replacement.

Steps involved in gene therapy

1. Creating a working gene
2. Building a therapeutic vector
3. Determining eligibility
4. Delivering the working gene
5. Regular monitoring after gene therapy is important.

New frontiers of gene therapy in transfusion medicine

1. Hemoglobinopathies
2. Hemophilia-
3. Inherited bone marrow failure syndromes
4. Primary immunodeficiency syndromes

Future prospects of gene therapy in transfusion medicine is blood component synthesis - to explore ex vivo generation of rbcs utilizing various cell fractions, including hematopeitic progenitor cells from cord blood and adult sources, as well as ipscs. Factors limiting gene therapy are problems with viral vectors, host immune response, multigene disorders and cost of therapy.

Small Lab, Big Impact : How Far Can We Go with A Basic Immunohematology Lab?

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Introduction:

Immunohematology is the backbone of safe transfusion practice, ensuring compatibility between donor blood and recipient needs. Large, well-equipped transfusion services often set the benchmarks for immunohematological testing. However, the reality in many developing countries, including India, is that most blood centres and transfusion services operate with limited resources. These "basic" immunohematology laboratories may lack advanced infrastructure but continue to play a crucial role in patient safety by adhering to fundamental principles of blood grouping, antibody screening, and compatibility testing. This raises an important question: *how far can we go with a basic immunohematology lab, and what impact can it truly make?*

The Role of Basic Immunohematology Laboratories

Fundamental Services

At its core, a basic immunohematology laboratory is equipped to perform:

- **ABO and Rh(D) typing** using standard tube or slide methods.
- **Direct and indirect antiglobulin testing** for hemolytic transfusion reactions, hemolytic disease of the newborn (HDN), and autoimmune hemolytic anemia.
- **Crossmatching** using immediate spin and antiglobulin phase.
- **Antibody screening and identification** (to a limited extent, often with pooled or limited commercial cells).

Despite their limitations, these services form the foundation of safe transfusion practices in small hospitals and community settings.

Contribution to Patient Safety
Even without advanced automation, a well-trained laboratory team can detect clinically significant incompatibilities, prevent major hemolytic reactions, and improve transfusion outcomes. The true "impact" of such a lab lies not in technology alone but in vigilance, adherence to protocols, and continuous quality improvement.

Challenges in Resource-Limited Settings

Infrastructure Limitations
Most basic laboratories lack automated blood grouping platforms, advanced antibody panels, and molecular typing facilities. Storage conditions, reagent availability, and reliable electricity may also be inconsistent.

Manpower and Training
A critical challenge is the shortage of trained immunohematologists and skilled technologists. Many centres rely on multitasking staff who may not have specialized training, leading to variability in test performance.

Referral Dependency
Complex antibody workups, Rh and Kell system discrepancies, or suspected transfusion reactions often necessitate referral to regional reference laboratories. While effective in theory, delays in reporting may affect patient care in emergencies.

Strategies to Maximize Impact in a Basic Lab

Standardization of Core Practices

- Strict adherence to ABO and Rh(D) testing in both forward and reverse groups.
- Performing antiglobulin crossmatches wherever feasible, especially in transfusion-dependent patients.
- Maintaining adequate reagent quality and documentation.

Quality Control (QC) and Quality Assurance (QA)

- Daily controls for reagents and antisera.
- Regular participation in **external quality assessment schemes (EQAS)**, even with limited resources.
- Use of Levey–Jennings charts and Westgard rules for internal QC, where possible.

Training and Capacity Building

Periodic workshops, hands-on training, and networking with referral centres can uplift the competency of staff. A motivated technologist in a basic lab can often make lifesaving observations that may otherwise go unnoticed.

Referral Networks and Tele-Support

Establishing strong linkages with regional reference labs ensures the timely resolution of complex cases. The use of digital platforms, telepathology, and remote guidance can bridge gaps without major infrastructure upgrades.

Case Examples of Big Impact from Basic Labs

- **Hemolytic disease of the newborn:** Early detection of maternal alloantibodies (anti-D, anti-c, or anti-K) by a vigilant basic lab can prompt referral, leading to better neonatal outcomes.
- **Transfusion-dependent thalassemia:** Systematic antiglobulin crossmatches, even in resource-limited settings, have reduced alloimmunization rates significantly.
- **Emergency surgeries:** Prompt detection of ABO incompatibility through careful bedside and laboratory checks can prevent catastrophic transfusion reactions.

These examples highlight that impact is not only technological but procedural and ethical.

The Way Forward: Expanding Horizons

Incremental Upgrades

Introducing **gel card systems, semi-automated grouping platforms, and basic antibody panels** can be gradual steps for small labs. Pooling of resources at the district or state level may also support cost-sharing models.

National Policies and Networking

Policies encouraging **tiered immunohematology services**—basic labs at peripheral hospitals, regional reference centres, and apex institutes—can create a strong transfusion safety net.

Research and Documentation

Even basic labs can contribute to national data on blood group frequencies, alloimmunization rates, and transfusion reaction audits, thereby enriching scientific evidence and guiding policy.

Conclusion

A small immunohematology laboratory, though limited in resources, can still make a big impact through adherence to fundamentals, vigilance, and networking. By standardizing practices, ensuring quality control, and fostering training, such laboratories can safeguard transfusion practices at the community level. While the ultimate goal remains universal access

to advanced testing, the journey begins with strengthening the basic laboratory—proving that small labs, when empowered, truly matter.

"The true impact of a lab lies not only in its technology, but in vigilance, protocols, and people."

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Past Triumphs & Future Horizons TRANSCON 2025

Donor Lymphocyte Infusions – The Way Forward

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Allogeneic hematopoietic stem cell transplantation (HSCT) has revolutionized the treatment of hematological malignancies and select non-malignant disorders. The curative basis of HSCT for hematologic malignancies relies upon induction of the graft versus leukemia (GVL) effect in which donor immune cells recognize and eliminate residual malignant cells within the recipient, thereby maintaining remission. Donor lymphocyte infusion (DLI) has emerged as a powerful immunotherapy strategy to enhance graft-versus- leukemia effect and consolidate remission.

What is DLI?

- Donor Lymphocyte Infusions (DLIs) are a form of adoptive immunotherapy where lymphocytes from the original stem cell donor are collected and infused into the patient after transplantation. These infusions contain T cells that can recognize and attack residual cancer cells, helping to prevent or treat disease relapse

Indications for DLI

Key indications include:

- **Relapse of malignant disease post-HSCT** – especially in chronic myeloid leukemia (CML)
- **Minimal residual disease (MRD) or molecular relapse** – pre-emptive DLI can restore remission before overt hematological relapse.
- Mixed chimerism – DLI facilitates conversion to full donor chimerism
- Post-transplant immunotherapy as prophylactic strategies in high-risk malignancies.

Types of DLI

DLI can be broadly categorized based on the timing:

- Therapeutic DLI – administered after hematological relapse.
- Pre-emptive DLI – given at the stage of MRD positivity or falling donor chimerism.
- Prophylactic DLI – given in remission to prevent relapse in high-risk settings.

Dosing

Current practice favors a graded, escalating-dose regimen, starting from 1×105 CD3+ cells/kg and increasing gradually if no GVHD develops, thereby minimizing toxicity while maintaining efficacy.

Complications of DLI

DLI is associated with following complications:

- GVHD (acute or chronic) remains the most serious, reported in up to 60% of patients.
- Marrow aplasia and cytopenias

Response to DLI

Response varies with disease type and disease burden at infusion:

- CML shows the most robust and durable responses, with molecular remission achieved in a majority of cases.
- Acute leukemias respond less consistently, with better outcomes in MRD-positive states than in frank relapse.
- Lymphoid malignancies demonstrate intermediate sensitivity.
  Overall, early intervention at molecular relapse and use of pre-emptive DLI are associated with superior outcomes.

DLI vs. Second HSCT

In patients relapsing after HSCT, the decision between DLI and a second transplant is complex.

- DLI is less toxic, avoids conditioning, and can induce durable remission, especially in indolent diseases or low disease burden states.
- Second HSCT may be preferred in aggressive relapses, graft failure, or in patients previously unresponsive to DLI.
- In some centers, sequential strategies combining DLI with reduced-intensity conditioning second HSCT are employed.

The Way Forward

The future lies in tailoring DLI to patient, disease, and transplant variables:

- **Personalized dosing** guided by immune monitoring and chimerism kinetics.
- **Integration with novel agents** such as FLT3 inhibitors, hypomethylating agents, and checkpoint inhibitors.
- **Engineered DLI** incorporating chimeric antigen receptor (CAR) modifications.
  Donor lymphocyte infusion represents a paradigm shift from chemotherapy-based salvage to immune-mediated control of relapse.

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Impact of Clinical Audits to Improve Patient Blood Management

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Introduction: Patient Blood Management (PBM) is an evidence-based, multidisciplinary approach designed to optimize the care of patients who may require blood transfusion. It focuses on managing and preserving the patient's own blood, minimizing unnecessary transfusions, and improving outcomes. While guidelines and best practices exist, the real challenge lies in consistent implementation at the bedside. Clinical audits provide a powerful mechanism to bridge this gap by systematically evaluating current practices, identifying deviations, and driving corrective actions.

Role of Clinical Audits in PBM: Clinical audits are structured reviews of medical care that compare actual practice against established standards. In the context of PBM, audits enable institutions to measure adherence to transfusion guidelines, assess appropriateness of transfusion decisions, monitor wastage of blood components, and evaluate patient outcomes. Through this cycle of measurement, feedback, and re-evaluation, clinical audits ensure that PBM strategies are not just theoretical but actively embedded into clinical practice.

1. **Optimizing Transfusion Practices:** One of the primary objectives of PBM is to avoid unnecessary transfusions, as they are associated with risks such as transfusion reactions, alloimmunization, immunomodulation, and increased healthcare costs. Audits of transfusion episodes help identify inappropriate triggers—for example, transfusing red cells at higher than necessary hemoglobin thresholds or using plasma without clear indications. By highlighting such patterns, clinical audits prompt clinicians to align their decisions with restrictive, evidence-based transfusion thresholds.

2. **Enhancing Pre-operative and Peri-operative Management:** In surgical settings, pre-operative anemia is a major risk factor for transfusion. Clinical audits that track the proportion of patients screened and managed for anemia before elective surgery reveal gaps in early intervention. Audit findings often encourage hospitals to implement pre-operative anemia clinics or iron supplementation protocols, thereby reducing transfusion rates and improving surgical outcomes. Similarly, peri-operative blood conservation techniques—such as cell salvage or controlled hypotension—can be better adopted when audits demonstrate their impact on reducing allogeneic transfusion requirements.

3. **Reducing Blood Wastage and Improving Inventory Management:** Blood is a precious and limited resource. Clinical audits that track component utilization, wastage rates, and out-of-date discards provide objective data to optimize inventory management. For instance, audits may reveal that certain departments routinely over-order platelets or plasma, leading to avoidable expiry. Armed with such insights, transfusion committees can refine ordering practices, improve communication with blood banks, and minimize wastage, ensuring that blood components are available for patients who truly need them.

4. **Improving Patient Outcomes:** The ultimate goal of PBM is improved patient safety and outcomes. Clinical audits can correlate transfusion practices with morbidity and mortality, length of hospital stay, and post-operative recovery. Evidence consistently shows that patients exposed to unnecessary transfusions often have poorer outcomes. By reinforcing adherence to PBM principles through regular audits, hospitals foster a culture where patient safety is prioritized over convenience, leading to measurable improvements in clinical outcomes.

5. **Education, Awareness, and Cultural Change:** An important but often under-recognized impact of clinical audits is their role in education. Presenting audit results during departmental meetings, morbidity and mortality reviews, or hospital transfusion committee discussions sensitizes clinicians to the consequences of their practices. This fosters

a culture of accountability and shared responsibility. Over time, the cycle of audit and feedback transforms clinical behavior, embedding PBM principles into routine care rather than viewing them as external mandates.

6. **Supporting Accreditation and Quality Standards:** Many national and international accreditation bodies require hospitals to demonstrate effective PBM programs and transfusion governance. Clinical audits provide the evidence base needed for compliance with these standards. By maintaining regular audit cycles, hospitals not only meet regulatory requirements but also showcase their commitment to quality improvement and resource stewardship.

Challenges and Way Forward: Despite their proven impact, clinical audits in PBM face challenges such as incomplete documentation, limited resources, and resistance to change. Success requires multidisciplinary involvement-hematologists, anesthesiologists, surgeons, intensivists, and nursing staff must collaborate. Digitalization of transfusion records and use of electronic health systems can make audits more efficient and less labor-intensive. Importantly, feedback from audits should be constructive, emphasizing education rather than blame.

Conclusion: Clinical audits are indispensable tools to strengthen Patient Blood Management. By identifying inappropriate transfusion practices, reducing wastage, optimizing pre-operative anemia management, and fostering cultural change, audits drive measurable improvements in patient outcomes and resource utilization. When integrated into hospital governance, they transform PBM from a guideline on paper into a living practice at the bedside. Ultimately, the sustained impact of clinical audits ensures that patients receive safer, evidence-based, and more efficient transfusion care.

Past Triumphs & Future Horizons
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Haemovigilance Programme of India – An Overview & Update

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The Haemovigilance Programme of India (HvPI) was launched on 10th December, 2012 by the National Institute of Biologicals (NIB), Ministry of Health & Family Welfare, Government of India as the National Coordinating Centre (NCC). The primary objective of HvPI is to protect public health by promoting safe and effective blood transfusion practices across the country. As a vital component of the national blood safety framework, HvPI plays a crucial role in enhancing transfusion safety and improving clinical outcomes. At present the programme is voluntary in nature.

Haemovigilance encompasses the entire transfusion chain—**from the donor's vein to the recipient's vein**—and operates through two key components:

1. **Recipient Arm:** This involves the **reporting of adverse reactions related to blood transfusion in patients,** which has been actively monitored under the Haemovigilance Programme of India since its inception in 10th December 2012.
2. **Donor Arm:** This focuses on the **reporting of adverse reactions associated with blood donation.** This aspect is addressed under the **National Blood Donor Vigilance Programme (NBDVP)**, launched on **14th June 2015,** coinciding with **World Blood Donor Day** at Science City, Kolkata. NBDVP functions under the broader umbrella of HvPI.

Since inception, HvPI has expanded its network to over **1700** centres including Medical Colleges, Blood Centres /Institutions Govt./ Private Hospitals nationwide. Data on Adverse Transfusion Reactions (ATRs) are collected through the **Transfusion Reaction Reporting Form (TRRF)** using an indigenously developed web-based software called **Haemo-Vigil**. Similarly, data on Adverse Donor Reactions (ADRs) are collected via the **Adverse Blood Donor Reaction Reporting Form (ABDRRF)** using another indigenously developed web-based software called **Donor-Vigil.** At present , due to technical issues with these web-based Haemovigilance software systems, the **Haemovigilance Programme of India (HvPI)** is currently collecting data through prescribed Excel formats—**TRRF and ABDRRF**—that are circulated to enrolled centres under HvPI.

To date, **more than 80,000 reaction reports** have been reported under HvPI. These reports not only present the findings but also include recommendations aimed at improving blood transfusion practices across the country. The insights gathered serve as critical inputs for policy changes, enhancement of standards, refinement of systems and processes, and the formulation of national guidelines.

Further strengthening its outreach and impact, the Haemovigilance Programme of India (HvPI) division has successfully published 16 research articles in national and international journals. In addition, the division regularly disseminates knowledge through its biannual *Haemovigilance Newsletters* and updated *Guidance Documents*, aimed at educating healthcare professionals and stakeholders about key developments in haemovigilance.

To enhance accessibility and stakeholder engagement, HvPI also operates a toll-free helpline (1800-180-2588), available Monday to Friday from 9:00 AM to 5:30 PM, to address queries and provide guidance related to the programme.

The Haemovigilance Division of the National Institute of Biologicals (NIB) actively collaborates with medical colleges, hospitals, and blood centres across the country. Through these partnerships, the division has organized **86** Continuing Medical Education (CME) programs, training sessions, workshops, conferences, and webinars. These initiatives have collectively trained approximately **16,418** individuals, including blood centre officials, clinicians, nurses, technical staff, blood donors, and motivators, thereby strengthening the implementation of HvPI nationwide.

HvPI not only focuses on improving practices domestically but also extends its support to neighboring countries like Bhutan and Bangladesh in establishing their own haemovigilance systems. HvPI collaborates actively with the World Health Organization and other countries in the Southeast Asia Region (SEAR) to strengthen haemovigilance efforts. As a member of the International Haemovigilance Network (IHN) since 2014, India continues to play a crucial role in advancing global standards for blood safety.

The Haemovigilance Program of India (HvPI) also conducted a survey from January to April 2022, featuring 27 questions to evaluate the program's strengths and weaknesses. Significant improvements were noted in both recipient and donor care. For recipients, 79.6% reported enhanced documentation of transfusion reactions, while 54% appreciated increased support from Hospital Transfusion Committees. Notably, 30.5% observed a reduction in near-miss errors, and 20.1% noted fewer ABO incompatible transfusions. Donor-focused enhancements included a more stringent medical questionnaire, with 68% indicating its implementation, and 56.4% reported initiatives like multimedia visuals and bedside counseling to reduce donor anxiety. Additionally, 65.2% adopted strategies such as encouraging pre-donation hydration and muscle tension techniques, and 68.4% provided special care for donors with adverse reaction histories. Early intervention was highlighted by 55.6% as critical for identifying and managing initial reactions to prevent complications.

Strengthening haemovigilance systems requires active cooperation among blood centres, hospitals, regulatory bodies, and other key stakeholders. By fostering strong collaborative networks, we can ensure safer blood transfusion practices and more effective monitoring and management of adverse reactions.

Updates in National Haemovigilance Program of India

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The National Haemovigilance Programme of India (HvPI) has undergone significant evolution since its inception in 2012. Recent developments in HvPI, characterized by enhanced technological integration, expanded coverage, and strengthened regulatory frameworks.

The HvPI program operates under the collaborative framework of the Indian Pharmacopoeia Commission and the National Institute of Biologicals (NIB), Noida, which serves as the National Coordinating Centre. Recent infrastructure developments have focused on strengthening the three-tier organizational structure comprising medical colleges, blood banks, government hospitals, and private healthcare institutions. (1) The program's expansion trajectory demonstrates remarkable growth, with enrollment increasing from 90 centers in 2012 to the current 1400+ centers, representing approximately one third of India's total blood centres. The geographic distribution shows continued concentration in urban areas, with ongoing efforts to bridge the rural-urban divide in haemovigilance coverage.

Recent Technological Advancements and Software Improvements

The Haemo-Vigil software has undergone significant enhancements since 2020, with the introduction of version 2.0 for both Transfusion reaction reporting form (TRRF) and adverse donor reaction reporting form (ADRRF) representing a major milestone in data quality improvement. Recent updates have focused on streamlining the reporting process through mandatory fields and auto checking of each field.

Data analysis and reporting: The NIB routinely conducted data analysis on submissions under the HvPI in collaboration with transfusion medicine experts. These analyses not only provide comprehensive reports in the form of publications but also offer recommendations and guidelines to mitigate adverse reactions and enhance the reporting of such reactions within the HvPI framework. Statistical analysis indicates that the overall incidence of adverse reactions reported to HvPI ranges from 8.3 to 8.6 per 10,000 blood products transfused, with mortality rates showing a temporal relationship in only 14 of 28 reported deaths classified as possible or probable. The program has documented over 2,737 adverse transfusion reaction reports since inception, representing a substantial database for safety analysis. (2)

Feedback program: The coordinating centre conducts a survey among its participating members to gauge their performance improvement, identify challenges, and propose suggestions for enhancing the HvPI program. Recent data from a multi-center survey conducted between January and April 2022 provides comprehensive insights into program effectiveness. With a response rate of 40.4% from 296 participating centers, the survey revealed that 85.7% of respondents reported changes in their blood center work procedures after joining recipient HvPI, with maximum improvement observed in documentation of transfusion reactions (92.7%). (3)

In a pilot study conducted by Bhat et al, several challenges were identified in the reporting of transfusion reactions in

various blood banks enrolled under the HvPI. The primary challenges identified were insufficient awareness among blood centre staff regarding hemovigilance, incomplete reaction reporting forms, inadequate follow-up of transfusion recipients, and a lack of clinician awareness. (4)

Training and awareness programs: The HvPI regularly conducts a training program in the country. They also organized the first-ever three-day national conference on haemovigilance, which attracted a substantial number of participants (over 1,000). The NIB also releases newsletters on a quarterly basis to disseminate knowledge. Additionally, the NIB released guidance documents for providing information regarding adverse reactions and steps to report them under the HvPI program. Furthermore, the HvPI released a document titled "Good Blood Transfusion Practices: Guidance for Rational Use of Blood" to raise awareness among clinicians and blood centres.

To implement recent advances: The National Institute of Blood and Immunology (NIB) has endeavored to regularly implement the recent advancements in the field of haemovigilance. Recently, the Association for Advancement of Blood and Biotherapies (AABB) released a severity grading criteria for donor adverse reactions. (5) NIB conducted a survey of 50 blood centres to assess their awareness and feasibility of implementing these criteria within the country. The findings revealed a general agreement of 66.4% between the participating centres and the expert group, with a fair Kendall's coefficient of concordance (W) of 0.271 (p-value < 0.05). (6)

International Collaboration and Network Participation

India's membership in the International Haemovigilance Network (IHN) since December 2014 has facilitated knowledge exchange and benchmarking against global standards. The IHN, comprising 30 member countries, provides a platform for sharing best practices and collaborative learning in blood safety monitoring. India's participation in IHN General Assembly meetings via webinars has enabled regular updates on program progress and international standards alignment. (7)
International collaboration has also facilitated access to advanced technologies and methodologies for the classification and causality assessment of adverse reactions. The adoption of International Society of Blood Transfusion (ISBT) standards for donor vigilance serves as a notable example of successful international harmonization. (8)

Regulatory Framework Updates and Policy Developments

Recent regulatory developments have strengthened the legal framework supporting haemovigilance activities. The 2015 office memorandum from the Drug Controller General of India mandating enrollment of all licensed blood centers under HvPI represents a significant policy milestone. The National Accreditation Board for Hospitals and Healthcare Providers (NABH) inclusion of HvPI enrollment as an accreditation standard in 2016 has further incentivized participation.

Future Directions and Technological Integration

Enhanced training programs and awareness campaigns are planned to address knowledge gaps and promote reporting culture among healthcare professionals. Integration of haemovigilance concepts into undergraduate medical curricula has been identified as a long-term strategy for improving program sustainability. (9)

Conclusion: HvPI has achieved remarkable progress over its twelve-year evolution, establishing itself as a comprehensive

blood safety monitoring system with international recognition. However, persistent challenges including underreporting, urban-rural disparities, and quality issues require sustained attention and innovative solutions. The program's success in addressing these challenges will determine its ability to achieve the ultimate goal of ensuring safe blood transfusions for all patients, regardless of geographic or socioeconomic constraints. (4)

The program's continued development requires sustained commitment from policymakers, healthcare providers, and stakeholders to transform haemovigilance from a monitoring system into a comprehensive quality improvement framework that ensures the highest standards of blood safety. Through targeted interventions and innovative approaches, HvPI has the potential to serve as a model for other developing nations seeking to establish robust blood safety systems.

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Achieving Blood Component Quality in 'Middleclass' Blood Centers

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Quality Assurance

Quality assurance is to assure the achievement of a desired quality of final product by following a set of procedures. Quality assurance in transfusion services begins from blood donors. For best results:

- Standard Operational Procedures (SOPs) must be documented by technical supervisors and taught to all relevant members of the staff.
- Written quality manual should include all administrative and technical procedures, details of these can be cross referred. These should be followed religiously.
- This forms the basis of all quality assurance programs. Each blood bank or component lab must establish their own program of quality assessment and improvement under the supervision of the head to ensure the policies and procedures are properly maintained and executed. The SOPs should be available to the personnel at all given times.

General Consideration for Quality Control

The laboratory quality control is a part of Quality Assurance Program. It has two aspects.

1. Internal Quality Control: It is a set of procedures, which laboratory staff uses for the continual evaluation of work carried out in the laboratory.
2. External Quality Control: It is a system whereby laboratory produces a set of reagents and techniques, the results of which are to be compared with those produced by an approved reference laboratory. Both internal quality control and external quality control will exercise a reasonably good control over the function of routine laboratory equipments, techniques and staff. One improves their QC and QA performance gradually with the experience of working towards it.

Requirements of Quality Control Laboratory

- A Quality Manager of laboratory should be responsible for over all quality control tests. He should be trained carry out quality control test himself and should have sufficient knowledge and authority to take necessary measures to correct any fault discovered during control testing.
- Putting up controls with every batch of samples, this should be a part of daily procedures
- Sterility of blood or its components is also a part of the quality assurance.
- In the laboratory strict aseptic precautions to be taken while bleeding donors and cleaning the phlebotomy area.
- Proper donor selection and proper procedure for phlebotomy along with preservation and storage before and during component preparation in closed system.

Periodic Equipment Maintenance.

1. Refrigerator

- Temperatures of blood and component storage refrigerators are to be checked DAILY. A temperature record sheet should be pasted on the blood refrigerator door each week for recording the temperature reading.
- Alarms should be checked on weekly basis for proper functioning.

2. Water Baths and Incubators

Check on daily basis for proper temperature and records maintained.

3. **Centrifuges**

   Maintenance is to be done on monthly basis for proper speed.

4. **Balances**

   Check every week with standard weights.

Quality Control of Components

Conversion of whole blood into components is highly developed now. All the tests necessary before releasing whole blood apply to individual components of a single donation too.

Tests on Components

No component should be released to stock unless the tests reports like Blood group, HBsAg, Anti-HIV, Anti HCV, VDRL and MP and should release the products for stock only after checking their TTD reports maintaining records of the issued components.

Processing of Component in Open System.

Saline washed red cells should be processed in a clean environment (laminar air flow) with acceptable aerosol count and air velocity). To prevent the microbiological contamination, a strict aseptic handling technique should be followed- PREFERABLY STARILE CONNECTING DEVICE. The procedure to assure the sterility of the processed unit needs to be validated. The component processed in open system should be used within 6 hours if the recommended storage temperature of the component is 18 deg. C to 22 Deg C. and within 24 hours if the recommended storage temperature is 4 deg C. to 6 deg. C.

Component Storage

Adequate space should be provided for storing components in proper order. The components should be stored at th e proper temperature with continuous recording of the temperature

Component Labelling

The component label and design should confirm with the specifications given by FDA. The component should be labeled with eye readable donor number, which links the donation to its donor. When component preparation requires the use of subsidiary packs, which are not integral pack or part of the assembly, a Pediatric Product System (PPS) must be followed to ensure that the addition pack is labeled properly.

When the component is divided for neonatal use, a PPS must be adopted to ensure that the sub-batches or units can be traced whenever required.

Discard of Non-conforming Components

Appropriate records of disposal of non-conforming components are maintained.

This includes:

- Donation number
- Component identity
- Reason for discard
- Date of discard
- Identify of person effecting the discard.

Transportation of Blood Components

The container should be secure and protect the component from damage during the transit. The container should not be exposed to extremes of the temperature during transportation.

Sampling:

Procedure should ensure that it truly reflects the contents of the component pack. Document a procedure to ensure the sterility and contents.

Frequency:

At least 1% or 4 units whichever greater is tested for Q.C.

Acceptance:

75% of the testing should fall within the limits specified.

Component Weight and Volume:

Since the volume is generally calculated by dividing component weight by its specific gravity, the following conventions are given for calculating the volume.

- **Whole blood:** Calculated by deducting the weight of the empty bag with anticoagulant from the weight of the bag with blood and dividing the resultant weight by specific gravity of 1.06.
- **Red cell components**: Calculated by deducting the weight of the empty bag from the weight of the bag with the component and dividing the resultant weight by specific gravity of 1.09.
- **Platelet and Plasma components:** Calculating the weight of components as above and the resulting weight is divided by specific gravity of 1.03.

Component Separation Procedures

Blood Collection

1. Always use triple, double or quadruple plastic bags (350 ml or 450 ml) or penta bags with integral tubing – closed system.
2. To prevent partial activation of the coagulation system, the blood must be collected rapidly with single venipuncture and with minimal trauma to the tissues.
3. Frequent, gentle mixing of blood with the anticoagulant must be ensured during collection.
4. All the satellite bags must be accurately identified, numbered, labeled as coming from the original unit. Each satellite bag will thus have a number of the original unit and the type of component it contains.
5. All blood bags must be processed within 4 to 6 hours of bleeding.
6. All blood bags must be accurately balanced before centrifugation.

Component Preparation

The whole blood should reach the component laboratory as soon as possible. To get the maximum benefit of the products it is necessary to separate within 6 hrs.

The components will be (1) Semi packed red cells (SPC) packs (2) Platelet packs (3) Buffy coat (optional) 4) Cryoprecipitate (5) Fresh Frozen Plasma (6) Cryo deficient plasma (7) Liquid stored plasma. Separation could be done while the other laboratory tests on the blood are being carried out like grouping and screening for hepatitis, VDRL, anti HIV and anti HCV. Thus the blood will not be required to be held in component laboratory for longer than what is usually required in the blood bank for processing of whole blood.

Balancing of Blood Bags and Centrifugation.

1. Weigh the blood bags on the balance. Any bag weighing less than 450 gms or 550 gms. Indicates that it was not properly collected respectively for 350 ml triple bags or 450 ml triple bags. The proportion of anticoagulant being more, the bag should be rejected.
2. Bags weighing about 450 gms are used for separation. A plastic piece with known weights of 0.1, 0.2, 0.3, 0.4 gms or rubber bungs or stopper etc. are used for balancing cups containing blood bags.
3. The balanced cups are carefully placed diagonally opposite in the cold centrifuge.

The centrifuges carefully lidded and shut, the chosen program, then run. – use of well programmed centrifuges which monitor speed and time at the time of processing are recommended.

Centrifuge Speed

HIGH SPIN: 3000 G. 5 Minutes: - Packed Red Cells
5000 G 7 minutes - Cell Free Plasma - Cryoprecipitate

LOW SPIN : 15000 G 3 minutes - - Platelet Rich Plasma - Platelet concentrate

Relative Centrifugal Force (g) = 28.38 x R x (rpm/1000)2 Or RPM = 187.6 g/R

R = radius of centrifuge rotor in inches

Note: Centrifuge operating manual should be checked for direct calculation of g to rpm.

Semi-Packed Red Blood Cell Concentrate

1. Collect blood in a collection unit with attached transfer bag.
2. Centrifuge at high spin at 4oC for 5 minutes.
3. Place the primary bag containing centrifuged whole blood on a manual expresser and release the spring, allowing the plate of the expresser to come into contact with the bag. Seal temporarily all the secondary satellite bag/s with clamp or any other means.
4. Keep primary satellite bag on the weighing scale, take the weight of the bag. Express out 100 +/- 10 ml. by breaking the seal of the tubing connecting to the original unit.
5. The original bag will be semi-packed red cells with a hematocrit of 65% to 70%. The bag is sealed and disconnected from the satellite bag/s.
6. Check the appropriate labeling on all the bags before disconnecting.
7. The semi-packed RBC are stored at 2oC to 4oC and used within 35 days.

Note: If blood is collected in a single bag, the above directions are modified as follows. After placing the bag on the expresser, apply a clamp to the tubing of a sterile transfer bag, aseptically insert the spike of the transfer bag into one of the outlet port of the bag of blood, release the clamp and continue as outlined above. **This is an open system and to be carried out under a laminar flow bench. The packed red cells are to be used as soon as possible. In case storage is unavoidable it should be used within 24 hours and to be kept at 4oC during storage.**

Red Blood Cells: Leucocyte Poor (LP RBC)

Leucocyte Poor Red Blood Cells (RBC) or Whole Blood (WB) may be prepared by centrifugation and removal of buffy coat; filtration by Leucocyte filter or a combination of these procedures. These leuco-poor products are primarily indicated for patients with febrile transfusion reactions to standard products due to (a) Leucocyte antibodies (b) decreasing the likelihood of allo-immunisation of patients to Human Leucocyte Antigens (HLA). Such products take time to prepare and hence “prior notification period” is necessary. Apart from a reduced incidence of febrile reactions, these products are otherwise similar to RBC in dosage, administration and hazards.

Saline Washed Red Cells

1. Carry out the procedure under laminar air flow bench.
2. The crosshatched blood bag is properly checked for macroscopic appearance.
3. Spray the bag with 70% ethanol and air dry.
4. Introduce 150 ml. – 200 ml. cold normal saline at 4 deg. C with the help of sterile disposable donor set.
5. The bag is now centrifuged upside down.
6. The red cells, which are settled at the bottom, are collected in the sterile transfer bag.
7. The transfer bag now contains only saline washed red cells, which may be diluted with normal saline if needed.
8. The washed red cells are used as soon as possible and not later than 24 hours, during this period it is stored at 4 deg. C.

Platelet Concentrates

1. Separate out platelet rich plasma in the satellite bag.
2. Do not seal but clamp all tubing.
3. Spin now at high spin for 10 mins. (At 4000 rpm – timing set depending upon the centrifuge used).
4. After stopping of centrifuge remove the bags carefully.
5. Express out platelet poor plasma from the PRP into the empty satellite bag.
6. Leave not less than 35 ml of plasma in the PRP bag, which is now platelet concentrates.
7. Seal all the bags i.e. (a) Semi-packed Red Cells (b) Fresh plasma which can be stored at –30 dg. C as FFP and (c) platelet concentrate pack at 20 deg. C to 22 deg C on an agitator.
8. The bags are appropriately labeled with blood group, expiry date, unit number, collection date etc. (e.g. depending upon the quality of the storage bags, platelet can be stored for 72 hrs. or for 5 days as per the claim of manufacturer).
9. Suspend platelet in platelet concentrate bags. At no time should the platelets be roughly agitated because this may cause platelets to aggregate irreversibly. The container should be left stationery at room temperature (20 deg. C to 22 deg. C) for approximately one hour. The platelet button may then be suspended in either of two ways:
   a) Manipulate the platelet bags gently by hand to allow uniform re-suspension.
   b) Place the container on the rotator at 18 deg. C to 22 deg. C, permitting gentle agitation until the platelets are uniformly re-suspended. This may take unto 2 hours.

Note: To obtain a better yield, the setting of the speed may vary (to give particular G value) according to the calibration of the centrifuge.

Calibrating Centrifuge For Platelet Separation

The centrifuge speed is mentioned by vendors **"BLOOD COMPONENT PREPARATION"**, however it needs to be calibrated for best yield of platelets.

1. Collect blood in EDTA tube from the donor in addition to the specimen drawn for routine processing.
2. Perform a platelet count on the EDTA specimen. If the donor has count below 133 x 109 /L (133 X 103 / ul) this unit of blood should not be used for calibration.
3. Calculate the number of platelets in the unit of whole blood (WB) Platelet count / ul x 1000 x volume of WB (in ml) = number of platelets in WB.
4. Prepare platelet – rich plasma (PRP) by centrifugation at a selected speed and time.
5. Place a temporary clamp after centrifugation on one tubing so that one satellite bag is closed. Express the PRP into the other satellite bag. Seal closer to primary bag and disconnect the two satellite bags. Do not remove the temporary clamp to the satellite bag until the next step.

6. Strip the tubing several times so that the tubing contains a representative sample of PRP.
7. Seal off a segment of the tubing and disconnect so that the bag of PRP remains sterile.
8. Perform a platelet count on the sample of PRP in the segment and calculate the number of platelets in the bag of PRP.
9. Platelet count /ul x 1000 x volume of PRP = number of platelet in PRP.
10. Calculate % yield:

    No. of platelets in PRP x 100

    No. of platelets in WB = % YIELD.
11. Repeat the above process three or four times with different donors, using different centrifuges, different speed and times of centrifugation.
12. Compare the yield for each set of test conditions.
13. Select the shortest time and lowest speed that result in the highest % yield of platelets in PRP without unacceptable levels of red cell contamination.
14. Centrifuge the PRP at a selected time and speed to prepare platelets.
15. Express the platelet-poor plasma into the second attached satellite bag and seal the tubing, leaving a long section of tubing attached to the platelet concentrate bag.
16. Place the platelets on an agitator and leave for at least 1 hour to ensure that the platelets are evenly suspended. Platelet counts cannot be preformed accurately on a product immediately after centrifugation.
17. Strip the tubing several times, mixing its contents well with the contents of the platelet bag. Let the concentrate flow back into the tubing. Seal off a segment of the tubing so that the platelet concentrate bag remains sterile.
18. Perform a platelet count. Calculate the number of platelets in the concentrate.
19. Calculate % yield:

    No. of platelets in PC x 100

    No. of platelets in PRP = % YIELD.
20. The shortest time and lowest speed that result in the highest % yield of platelets in PC. Once each centrifuge has been calibrated, it is not necessary to recalibrate unless there is a problem with the mechanical functions of the centrifuge.

Fresh Frozen Plasma (FFP)

1. Centrifuge the original unit of blood at heavy spin 5000 rpm for 7 minutes at 4 deg. C to 6 deg. C within 6 hours of collection.
2. Express out the plasma into satellite bag using manual expresser or optipress.
3. Place plasma bag flat at or below -30 deg. C or below with the other empty satellite bag.

   The frozen plasma is stored at -30 deg. C, FFP can be used for 1 year from the date of blood collection.

   (The cryoprecipitate is prepared from the FFP with in a year).

Check on thawing of FFP during storage:

1. Place a rubber band around the bag of plasma, freeze and then cut off after the unit is frozen leaving an indentation that disappears with thawing.
2. Once thawed the unit must be transfused immediately for replacement of labile coagulation factors and within 24 hours if used as a plasma volume expander.

Cryoprecipitate

1. The bag of FFP prepared and stored as described under FFP preparation is hung upside down in the blood bank refrigerator on a hook at 4 deg. C.
2. At this temperature the plasma slowly thaws and flows down into the second satellite bag. This plasma is deficient in F VIII and Fibrinogen.
3. When approximately about 15-20 ml. of ice mass left in FFP bag the tubing are clamped. The FFP bag contains the cryoprecipitate (rich in F VIII) adhered to the ice mass and on the walls of the bag.
4. The two satellite bags are sealed, detached and stored frozen at or below -20 deg. C to -30 deg. C.
5. The cryoprecipitate can be used if stored frozen at or below-20 deg. C to -30 deg. C. for one year from the date of collection.
6. The bags are labeled appropriately with expiry date.
   (i.e. 1 year from the date of blood collection).

Note: 1. All blood components should be legibly labeled.
2. All labels should be waterproof.

Near Miss, Big Impacts : Learning Through Real World Data

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Introduction: Definition of Near Miss

In blood banking, a "near miss" is a deviation from standard procedures that is caught before it can harm a patient. By using real-world data to analyze these events, blood centers and hospitals can learn from mistakes, improve processes, and prevent future transfusion errors. This proactive approach is a cornerstone of hemovigilance, the practice of tracking adverse reactions and incidents related to blood transfusion.

Most Blood center disasters are preceded by near-misses, where something goes awry but Standard operative procedures prevent things from going truly and irreparably wrong. Common near-miss events and lessons from real-world data--Chhattisgarh

Most common error in Blood centers:

- Errors in the collection and labeling of patient sample for pretransfusion testing are known to be an important source of transfusion-related patient morbidity and mortality [4]. Near-miss events are five times more frequent than actual transfusion errors, and the majority of errors are detected before the blood is issued, because of multiple levels of cross checks.

1. Wrong Blood in tube(WBIT):•What happens: Blood is collected from the wrong patient, or a sample is mislabeled with the wrong patient's information. For example, a sample from Patient A is labeled with Patient B's information.
   - Common Culprit area—Emergency and Busy wards!

   How we Deal?
   - Keeping check on transfusions going on.
   - Avoiding night time transfusions.
   - Making sure that the Blood groupreports are in file
   - Making Nursing staff aware of same and placing them far apart in wards and ICU to avoid mismatched transfusion.
   - Training of Nurses and phlebotomists.
   - Implementing bedside patient identification with barcode scanners to confirm the patient's identity before collecting a sample and using two identifiers to identify patient.
   - Creating dedicated phlebotomy stations in emergency rooms to standardize and control the collection process.
   - Implementation of two sample norm.
2. Request errors:MC --Type and screen labelled as Cross match and Reserve
   - Result—Wrong request leading to unnecessary cross matches , unnecessary component reservations which adds to final patient bill as well as burden on Blood bank for donation, cross matching, testing and

reservation of Blood which is ultimately questioned by the paying party that is patient and attendent, and by treating consultant as well.

3. Processing and storage errors:•What happens: A blood unit is issued for the wrong patient, or a technician mishandles or incorrectly interprets testing results.
    - Data –2/6477 issues—thankfully caught in time by OT staff!!!!
    - Real-world data shows that multitasking and lack of ownership can contribute to laboratory errors, as demonstrated by root cause analysis of specific near-miss incidents.• what helped us--Release of Blood group report before issue of Blood and online availability of same—holds true for night time issues and holidays too
    - Blood group sticker on patient file.
    - Anesthetist being aware of transfusion protocol especially in emergency hours.
4. Supply chain and inventory issues:•What happens: Blood units are left out of controlled storage for too long and are not reissued, or supply chain bottlenecks create shortages.
    - How data helps: Big data analytics applied to transfusion medicine can identify patterns in blood usage, helping blood centers and hospitals manage inventory more efficiently.

Culprit—Surgical units

- What happens—
- Blood units being reserved and not issued,Blood units being issued and left in cold box, Blood units being issued , left in OT area Blood bank refrigerator and the surgical team not aware about it.
- What helped us--Training of consultants and treating teams about Blood Bank policies.
- Being aware of OT list 24 hours prior.
- Being in touch with surgical teams 24/7
- Making consultants answerable for bad choices!

Take away:

- Our near-miss event data are likely representative of most transfusion services. In the SHOT report of incorrect blood components transfused, 61 percent were either collection, ordering, or transfusion errors; 36 percent were laboratory errors; and 3 percent were blood center errors (Callum Et.Al.)
- Our data revealed strikingly similar proportions for near-miss event reporting, with 61 percent of errors originating from the wards(request errors) 35 percent from the phlebotomy desk(labeling errors) and 4 percent from our own unit. We believe that tracking of near-miss events will help institutions predict the distribution of serious errors and guide corrective action. Tracking of events after corrective action helps in the determination of the efficacy of the corrective action, in a clearer understanding of the system if the corrective action fails, and in the provision of evidence that justifies the financial cost of the next type of corrective action.
- We have seen that daily tracking of Blood units plays a fine role in maintaining the sanctity and transparency of system
- Also, being open about mistakes and healthy discussion goes a long way in preventing near-miss from Actual misses.

Car T Cell Therapy and Role of Transfusion Medicine

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Chimeric antigen receptor (CAR) T cell therapy is an individualized immune or cellular therapy where genetically modified T cells eliminate cancer cells. The manufacture of CAR-T cells consists of several steps. The first step is leukapheresis where whole blood goes through peripheral blood mononuclear cells collection. The immune system which classically consists of the innate and adaptive parts has overlapping functions and is intimately related. The innate immune system act as the first line of defence does not require prior stimulation by antigens and includes dendritic cells, natural killer cells (NK), macrophages, neutrophils, eosinophils, basophils, and mast cells. The adaptive immune system requires the presentation by the antigen-presenting cells (APCs) for its activation and includes B lymphocytes, helper T lymphocytes, and cytotoxic T lymphocytes (CTLs) [1]. The adaptive immune system produces antigen-specific T- and B- cell lymphocytes.

Cancer immunotherapy is rapidly evolving and can now be considered as one of the important pillars of cancer therapy, along with surgery, chemotherapy, and radiation therapy. Though the limited understanding of immune regulatory mechanisms hampers the implementation of immune-based protocols in cancer treatment, its promising effects bring us closer to a future where this disease can be successfully controlled. It uses the antitumor properties of the immune system to fight cancer. Different types of cancer immunotherapies include immune checkpoint inhibitors, monoclonal antibodies, oncolytic virus therapies, cancer vaccines, immune system modulators, adoptive therapies, etc which induce, augment, suppress or release the suppression of the immune system response [2]. Cancer immunotherapy focused on T cells has surfaced as a powerful tool in the armoury against cancer.

Adoptive cellular therapy (ACT) typically refers to a cellular infusion product [2]. It implies the infusion of immunocompetent cells and is a robust form of immunotherapy for the treatment of established tumors [2]. It encompasses the isolation and in-vitro expansion of autologous or allogeneic tumor-specific T-cells, followed by infusion back into the patient. The various kinds of immune cells which have been used in adoptive cell therapy include tumor-infiltrating lymphocytes, natural killer cells, cytokine-induced killer cells, T- cell receptor (TCR) T cells, and chimeric antigen receptor T cells [3]. One of the most important and promising examples of ACT is chimeric antigen receptor T-cell immunotherapy for the treatment of B-cell hematologic malignancies.

CAR-T cell therapy is novel immunotherapy for cancer treatment involving the adoptive transfer of autologous T cells bioengineered by gene transfer to express receptors that target molecules expressed on malignant cells [4, 5]. The efficacy of CAR-T cells for the treatment of acute B lymphocytic leukemia (B-ALL) has been revolutionary and numerous clinical trials using CAR-T cell therapy in the treatment of various types of tumors have been stated [6-8]. CARs are engineered receptors that redirect most commonly the T lymphocytes to recognize and eliminate cells expressing a specific target antigen.

CAR stands for chimeric antigen receptor, which represents the genetically engineered portion of the T cell. T cells transduced with tumor-specific CAR, these cells modified to better recognize and kill the cancer. The CAR part of the T cell contains proteins that allow the T cells to recognize the specific cancer cells as well as become highly activated to kill the cancer cells. The T cells are engineered in the laboratory and then expanded to large numbers and infused back into the patient. Once in the body, the CAR T cells can further grow to large numbers, and can persist for long periods.

Structure of Chimeric Antigen Receptor (CAR)

CARs are integrated synthetic receptors that consist of the following main components:

(a) target antigen binding domain (extracellular),

(b) a hinge region,

(c) a transmembrane domain, and

(d) one or more signalling domain (intracellular)

With progressively more effort put into cancer adoptive cell research, CAR-T therapy has gone through generations.

Steps in CAR cell therapy

- **Apheresis**
  T cells are isolated and collected from the patient's peripheral blood (leukapheresis)
- **Activation of T cell**
  T cells are transformed into cytotoxic T cells
- **Transfection**
  A gene is inserted using a virus that causes the CAR to be expressed by the T cell
- **Cell Expansion**
  Cells are in culture, allowing them to expand and proliferate
- **Cryopreservation**
  Cells are purified and cryopreserved (can be a fresh infusion)
- **Administration**
  Cells are infused into the patient

Applications of CAR T is in:

Acute lymphoblastic leukemia

Chronic lymphoblastic leukemia

Lymphoma Multiple myeloma

In solid tumors: limited role

Role of Transfusion Medicine

Leukapheresis for T cell collection:

The execution of CAR-T therapy requires coordination between clinical, laboratory, and transfusion medicine services. The main role of Transfusion Medicine services is to evaluate the patient for Leukapheresis for collection of T lymphocytes and to perform Leukapheresis.

Manufacturing CAR-T cells is a complicated process that begins with leukapheresis to obtain T cells from the patient's peripheral blood. Apheresis collection of the mononuclear cell (MNC) layer has been shown to be a safe and efficient method of collecting the large number of T lymphocytes necessary to initiate CART cell culture. An optimal leukapheresis product is a crucial step for a successful CAR-T cell therapy; therefore, it is imperative to understand the factors that may affect the quality of T cells. The leukapheresis for CAR-T cell production is generally well-tolerated and safe procedure.

Starting materials for the manufacture of CAR T cells are CD3+ T lymphocytes, which are found in the peripheral blood mononuclear cell (MNC) layer and derived from the unstimulated leukapheresis of patients (autologous) or healthy donors (allogeneic). The process of apheresis involves the removal of whole blood, separation of components by centrifugation, removal of peripheral blood MNCs and return of the remaining components to the patient or donor (7). Unstimulated CAR T cell leukapheresis is usually performed in a single day (rarely over 2 days) and requires experienced apheresis staff, a central venous access service and cell separator platforms.

Most CARTs are manufactured from autologous peripheral blood mononuclear cells (PBMNCs) collected by

leukapheresis, followed by T cell selection, activation, gene modification, and expansion (8). There are several factors to consider when performing leukapheresis. The goal of every leukapheresis is to reach target cell dose, The blood volume is processed to achieve the target dose of T cells for infusion of CAR-T cells usually at a dose of 1–1.5 × 106/kg or CD34+ cells ≥ 2 × 106 cells/kg body weight of the recipient (9, 10). Ensuring optimal hematologic parameters is crucial to maximize T cell yield and minimize the need for repeat procedures. Although in general, absolute lymphocyte count (ALC) thresholds to start leukapheresis can vary between different CAR-T cell protocols, ALC of > 100 cells/µL is acceptable, while ALC of > 500 cells/µL (or an absolute CD3 + lymphocyte count of >150 cells/µL) is optimal (10). As per European Society for Blood and Marrow Transplantation (EBMT) guidance, ALC and CD3+ cell count >0.2 x 109/L is recommended prior to T-cell harvest (12). The quality of the apheresis product affects the yield and success of the CAR-T cell production and clinical outcomes. Despite technical advances in methodology, CAR T-cell manufacture failure is reported in 1-13% of patients in clinical trials and is frequently attributed to the poor quality and poor yield of autologous T-cell harvest (11). Baseline factors associated with poor yield include low peripheral blood absolute lymphocyte count (ALC), low CD3+ count, high natural killer cell count and high circulating blast count. The main limitations include complex and expensive manufacturing processes, and can lead to product variability and delays. CAR-T cell therapy is not widely available due to its high cost and limited availability.

CAR T cell therapy is not limited to cancer treatment and is being explored for the treatment of various pathological conditions such as autoimmune diseases, fibrotic diseases, infectious diseases etc.

Conclusion:

CAR-T cells have transformed the treatment of certain hematological malignancies however, as outlined obstacles persist. Optimization of the leukapheresis process is clearly important for achieving a high rate of CAR T-cell manufacturing success. A basic requirement for CAR T-cell manufacturing is the ability to collect a sufficient number of viable T cells during leukapheresisTo meet the demands of this complex and progressing field.

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TRANSCON 2025

Standards and Accreditation For Cellular Therapy Program

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Introduction

In the field of cell therapy, the intrinsic variability of product starting materials obtained from patients, the subsequent variability of the therapeutic products, and complexity of shipments represent peculiar situations different from standard pharmaceutical drug production. Accordingly, regulatory strategies have been evolved for unique patient-specific cell therapies that take these differences into account.

A cellular therapy product collection facility or service (peripheral blood or bone marrow) may apply for accreditation as an integral part of a clinical transplant program, as an independent collection service providing cell collection services for one or more clinical transplant programs, or in conjunction with a cell processing facility if the services of collection and processing/storage are functionally linked.

Graft manipulations in Cellular Therapy

1. **Unmanipulated**
2. **Minimally manipulated:** Processing does not alter the original relevant characteristics of the cells or tissues. E.g. centrifugation, immunomagnetic separation or cryopreservation.
3. **More than minimally manipulated:** Processing alters the biologic characteristics & thus potentially the function or integrity of cells or tissue. E.g. Cell expansion, encapsulation, activation or genetic modification.

Standards for Hematopoietic Progenitor Cells Transplantation (HPCT)

Hematopoietic Progenitor cells (HPC) are an example of well researched cell type. They are already in clinical use for hematopoietic reconstitution. Hitherto, bone marrow (BM) was the only source of such cells; however alternate sources like mobilized peripheral blood, and cord blood are now being increasingly recognized for their potential clinical use. Hematopoietic Progenitor Cell Transplantation (HPCT) is an important treatment modality for various malignant and non-malignant disease conditions

Standards: Accepted performance guidelines

Important international organizations for formulating standards and accreditation are AABB, American Society for Blood and Marrow Transplantation (ASBMT),American Society for Apheresis (ASFA), European Group for Blood and Marrow Transplantation (EBMT), Foundation for the Accreditation of Cellular Therapy (FACT),ICCBBA, International Society of Blood Transfusion(ISBT), International Society for Cellular Therapy (ISCT),ISCT Europe, Joint Accreditation Committee of ISCT and EBMT (JACIE), National Marrow Donor Program (NMDP), and the World Marrow Donor Association (WMDA).

In India CDSCO is the licensing authority for approving HPC/Hematopoietic Stem cells harvest in the blood Centre. There is no specific authority for accreditation of specific HPC programme and it comes under NABH (Blood Banks).

Quality assurance

The actions, planned and performed, to provide confidence that all systems and elements that influence the quality of the

product or service are working as expected or exceed expectations individually and collectively. Standard Operative Procedures (SOPs) for collection, labelling as per ISBT 128, transportation, processing, storage (cryopreservation) and release for clinical use of HPC should be clearly laid down to ensure the same.

Process Flow for Quality Assurance of HPCT products

HPC Donor Assessment→ Mobilization → Collection → Processing→ Cryopreservation→ Storage/Thawing/Infusion Distribution ← Acceptance ← Quality Control

Quality Control

1. SOP: Detailed SOP; timely up dating
2. Documentation, Record keeping: record of all activities from collection to dispatch
3. Personnel qualification-Trained competent staff
4. Management of all critical equipments used in HPC enumeration, collection, processing, cryopreservation and storage.

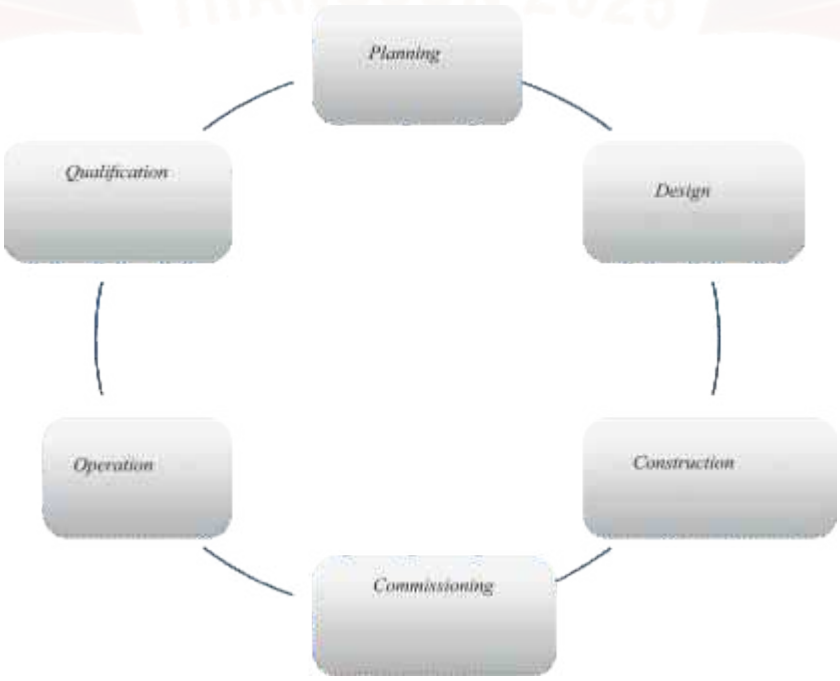
GMP facility for more than minimally manipulated cell-based therapies including CAR T cell therapy

GMP is defined as "A system for ensuring that products are consistently produced and controlled according to quality standards."

Purpose of GMP facility

1. Higher quality products
2. Reproducible products
3. Traceability of products
4. Clinical safety
5. Validated SOPs

Phases for establishment of Clinical Grade Cell therapy facility



US FDA regulations for cellular therapy products

1. Use of CT products is codified within the CFR in following sections:
   - IND regulations= 21 CFR 312
   - Biologics regulations= 21 CFR 600
   - cGMP = 21 CFR 211

2. Federal regulation on Cellular therapy is divided into 2 sections:
   - 361 products and 351 products
   - Traditional blood and BM progenitor cells as well as other tissues for transplantation f all into 361 products

Indian scenario: Regulation of Cellular Therapy products

Product characteristic	Industry action required	Submission to FDA
Minimally manipulated autologous/ related – allogeneic metabolic	GTPs relating to contamination, integrity and function	No FDA submission regarding processing.
More than minimally manipulated or unrelated metabolic	Would have to follow GMPs and have stricter processing controls encompassing clinical safety and effectiveness concerns	Requires FDA submission regarding processing

Challenges in establishing Cellular Therapy facilities

1. **Compliance**
   - GTP guidelines
   - GMP guidelines

2. **Safety**
   - Risk elimination
   - Sterility assurance
   - Cross contamination avoidance

3. **Reproducibility**
   - Minimize operator tasks
   - Eliminate Unexpected situations
   - Reduce workload

4. **Effectiveness**
   - Easy scalability

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Challenges of Immunization in Repeated Transfusions

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Blood transfusion is one of the most important therapeutic interventions in modern medicine. For patients with chronic transfusion requirements—such as those with thalassemia major, sickle cell disease, aplastic anemia, myelodysplastic syndromes, and select oncological or hematological conditions—regular and repeated transfusions are essential for survival and quality of life. However, with this lifesaving therapy comes an inherent set of complications, one of the most significant being alloimmunization, the development of antibodies against foreign antigens on transfused red blood cells, platelets, or leukocytes. The phenomenon of immunization in repeated transfusions represents a complex clinical challenge that impacts both patient safety and the management of scarce transfusion resources.

Understanding Alloimmunization

When a patient receives donor blood containing red cells with different antigenic determinants from their own, their immune system may recognize these antigens as foreign. Sensitization results in the production of alloantibodies, which can complicate subsequent transfusions by:

1. Causing hemolytic transfusion reactions, whether acute or delayed.
2. Reducing red cell survival, leading to suboptimal transfusion efficacy.
3. Narrowing donor compatibility, making it progressively more difficult to find suitable units. The rate and severity of alloimmunization are influenced by both donor-related and recipient-related factors, as well as environmental and health system variables.

Key Challenges

1. **Antigenic Diversity**
   The red blood cell membrane carries more than 300 recognized antigens, organized into over 47 blood group systems. Commonly, transfusion practice is limited to matching for ABO and RhD antigens. However, mismatches in other Rh subgroups (C, c, E, e), Kell, Kidd, Duffy, and MNS systems frequently trigger alloimmunization in multitransfused patients. Without extended antigen matching, the likelihood of developing clinically significant alloantibodies rises substantially.

2. **High-Risk Populations**
   Patients with transfusion-dependent conditions are particularly vulnerable to immunization due to:
   - Frequency of exposure: Repeated transfusions increase cumulative antigenic exposure.
   - Early age of initiation: Children with thalassemia often begin transfusions within the first year of life, prolonging exposure.
   - Genetic disparities: In populations where donor pools do not reflect the genetic makeup of recipients (e.g., minority groups or regions dependent on mixed donor sourcing), mismatch risks are higher.

3. **Variability in Immune Response**
   Not all patients develop alloantibodies, even after multiple transfusions. Host-related factors such as genetic predisposition, HLA type, inflammatory milieu, immune regulation, and presence of autoimmune conditions play a role. This unpredictability complicates the risk assessment and necessitates individualized strategies.

4. **Delayed Hemolytic Transfusion Reactions (DHTRs)**
   Alloantibodies can sometimes fall below detectable levels, only to reappear upon re-exposure to the antigen. Such

an anamnestic response can lead to serious, under-recognized DHTRs, often presenting as unexplained anemia, jaundice, or ineffective transfusion response, making clinical management challenging.

5. **Resource Limitations in Extended Typing**
   Routine transfusion services in many regions, especially resource-constrained settings, do not have the capacity to perform full antigenic profiling of donors and recipients. Therefore, provision of phenotypically matched or antigen-negative units is often impractical. Molecular typing, which offers greater precision, is available in select centers but not universally accessible.

6. **Platelet and HLA Immunization**
   Besides red cell antigens, repeated exposure to alloantigens through platelet transfusions can lead to HLA and human platelet antigen (HPA) sensitization.This can result in platelet refractoriness, limiting therapeutic efficacy in conditions like leukemia and bone marrow failure syndromes.

7. **Limited Donor Registries and Rare Antigen Units**
   Even when alloantibody profiles are known, finding antigen-negative compatible units is not always feasible. Rare phenotypes may not be adequately represented in local donor populations, requiring regional, national, or international collaborations to source suitable blood.

Strategies to Mitigate Alloimmunization

Although alloimmunization remains a formidable hurdle, several strategies are available or under development:

1. **Extended Antigen Matching**
   Providing red cells matched not only for ABO and RhD but also for other major Rh antigens and Kell has been shown to significantly reduce alloimmunization rates, especially in chronically transfused patients.
2. **Molecular Typing and Genomic Approaches**
   DNA-based typing allows for precise determination of recipient and donor antigens, including rare variants. Integration of such technologies into donor recruitment and patient typing can optimize compatibility while conserving resources.
3. **Rare Donor Registries**
   Networking at national and international levels to create rare donor panels provides a crucial lifeline for difficult-to-match patients. In India, expanding such registries will be key to addressing disparities.
4. **Leukoreduction and Immunomodulation**
   Universal leukoreduction has been associated with reduced alloimmunization against HLA antigens. Similarly, research into immunomodulatory therapies to mitigate alloantibody responses is ongoing.
5. **Targeted Prophylaxis in High-Risk Groups**
   Patients with thalassemia or sickle cell disease may benefit from proactive extended matching from the start of transfusion therapy. Anticipating risk early can prevent difficulties later when alloantibodies develop.
6. **Patient Education and Record Maintenance**
   Maintaining transfusion and antibody history in accessible formats (such as electronic immunohematology databases or patient “antibody cards”) allows clinicians to plan transfusions more safely and reduces risks of incompatible transfusions.

The Road Ahead

The challenge of immunization in repeated transfusions reflects a broader intersection of clinical medicine, laboratory science, public health policy, and resource allocation. As transfusion medicine matures in India and globally, the following priorities will be central:

- Integration of molecular immunohematology into routine workflows.
- Development and strengthening of national rare donor databases.
- Prioritization of extended matching for high-risk populations.
- Collaboration between clinicians, transfusion specialists, and policymakers to ensure equitable allocation of resources.
- Continued research into patient-specific immune regulation and strategies to prevent alloantibody development.

Conclusion

Repeated blood transfusions are indispensable for countless patients, but alloimmunization remains a significant and evolving challenge. Addressing it requires a multidimensional approach—strengthening laboratory capabilities, fostering rare donor registries, implementing extended matching strategies, and educating both patients and healthcare providers. By acknowledging and tackling these challenges, the transfusion community can ensure that repeated transfusions remain not only lifesaving but also safe, effective, and sustainable in the long term.

Past Triumphs & Future Horizons
TRANSCON 2025

Achieving Blood Component Quality in 'middleclass' Blood Centers

Mukund Khandelwal and Yogini Patel.

Vedantaa institute of Medical sciences , Dahanu Palghar –Maharastra.

Material and Methods:
Quality in preparation and use of blood components is vital for so call middleclass blood centers.

Discussion:
The Better known blood centers {about25%} are managed by the multinational corporates and have a structured system for component production. They have in-house facility for evaluation of the components and quality control. About 40%of blood centers just need to be categorized as 100% components producing, however these submit all FFP to the commercial component plants, components from such blood get and bulk transferred to Plasma fraction enters.

Results:
This presentation focuses on achieving quality components, blood centers producing their own therapeutic component and doing their own Quality Control. Dos n Don'ts, which impact the therapeutic values. Ways and means to overcome hurdles and achieve quality in component lab.

स्वर्णजयंती
Past Triumphs & Future Horizons
TRANSCON 2025

Risk Mitigation For Incompatible Blood Transfusion

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Background

Blood transfusion is one of the most widely performed hospital procedures and is often life-saving in critical care, trauma, obstetrics, surgery, and oncology. However, it carries significant risks, particularly when an incompatible unit of blood is administered. Incompatible transfusion is among the most feared adverse events in transfusion medicine, often leading to acute or delayed hemolytic reactions, multi-organ dysfunction, prolonged hospitalization, and mortality. Despite remarkable advances in laboratory testing, automation, and information technology, transfusion errors continue to occur globally, predominantly due to human factors, process lapses, or communication failures. Therefore, a comprehensive framework for risk mitigation is essential to safeguard patients and maintain trust in transfusion services.

Objectives

This work aims to highlight strategies that reduce the likelihood and impact of incompatible blood transfusion. Specific objectives include:

1. Identifying common causes of incompatible transfusion events.

2. Reviewing current preventive, detective, and corrective measures.

3. Assessing the role of training, hemovigilance, and emerging technologies.

4. Proposing a multi-layered framework to minimize risks across the transfusion chain.

Methods

A structured review of published literature, international hemovigilance reports, WHO and AABB guidelines, and institutional best practices was conducted. Analysis focused on patient identification errors, pre-transfusion testing failures, laboratory practices, bedside administration, and emergency settings. Case studies of near-miss and actual incompatible transfusion events were evaluated using root cause analysis (RCA) and Failure Mode and Effect Analysis (FMEA). Risk mitigation measures were categorized into four domains: (a) patient identification and bedside practice, (b) laboratory testing and technology, (c) system-level and regulatory safeguards, and (d) clinical management and reporting of adverse events.

Results

Findings reveal that over 60% of incompatible transfusion events arise from patient or sample misidentification, emphasizing the importance of two-point identification, barcoding, and electronic positive patient identification (ePPID). Bedside cross-checking by nurses and physicians further reduces clerical errors.

Laboratory safeguards remain central to prevention. Automated ABO/Rh typing, antibody screening, and crossmatching provide higher accuracy compared to manual tube methods. The use of gel cards and solid-phase platforms enhances sensitivity in antibody detection. Integration of laboratory information systems (LIS) with hospital electronic medical

records (EMR) prevents mismatched unit release and enables alerts for alloimmunized patients. External Quality Assurance Schemes (EQAS), internal quality control, and dual verification of results strengthen reliability.
System-level strategies play an equally critical role. Computerized physician order entry (CPOE), electronic crossmatch, and real-time transfusion tracking software enable end-to-end traceability. National hemovigilance programs encourage incident reporting, while RCA of near-miss events identifies process gaps. Accreditation bodies such as NABH, CAP, and JCI mandate stringent transfusion protocols, periodic audits, and continuous improvement cycles. Institutions adopting FMEA proactively detect vulnerabilities and implement corrective measures before harm occurs.

Competency and training emerged as consistent themes. Regular workshops, simulation drills, and refresher programs enhance healthcare worker vigilance and improve recognition of early transfusion reactions. Non-punitive error reporting systems encourage staff to disclose errors, fostering a culture of safety rather than blame.

When incompatible transfusion occurs, rapid recognition and immediate intervention mitigate harm. Protocols include immediate cessation of transfusion, aggressive hydration, diuretics, vasopressors, renal function monitoring, and supportive care for disseminated intravascular coagulation. Laboratory confirmation using direct antiglobulin tests (DAT), re-testing of donor units, and clerical verification help establish the cause and prevent recurrence.

Patient-centered interventions also reduce risk. Issuing transfusion alert cards, extended antigen typing for chronically transfused patients (e.g., thalassemia, sickle cell disease), and obtaining informed consent strengthen patient involvement.

Emerging technologies offer promising risk reduction pathways. Artificial intelligence (AI) models predict transfusion risks by analyzing large datasets, blockchain ensures transparent tracking of blood units, and next-generation sequencing (NGS) enables accurate genotyping for better donor–recipient matching.

Conclusion

Incompatible transfusion remains a critical, preventable threat in transfusion medicine. Risk mitigation requires a multi-dimensional approach integrating patient identification, laboratory vigilance, information technology, regulatory oversight, staff training, and patient engagement. While zero error rates may be aspirational, adopting a layered defense system—spanning bedside practice, laboratory quality control, hemovigilance, and emerging technologies—significantly reduces the incidence and consequences of incompatible transfusion. Hospitals must embed a culture of safety, encourage error reporting, and invest in advanced transfusion systems. Future integration of AI, blockchain, and genomic matching holds promise for near-elimination of such events. Ultimately, transfusion safety depends on the collective responsibility of clinicians, nurses, laboratory personnel, administrators, and patients, ensuring that every unit of blood given is both appropriate and life-saving.

Keywords: Blood transfusion, incompatibility, patient safety, risk mitigation, hemovigilance, transfusion errors, immunohematology

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Oral Papers

OP 1

REINTEGRATING DEFERRED DONORS: IMPACT OF DONOR WELLNESS CLINICS IN OPTIMIZING INDIA'S BLOOD DONATION SERVICES

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Background: Very often healthcare relies upon blood transfusions, and pre-donation screening ensures donor safety. However, these screenings often result in donor deferrals either temporary or permanentation due to various health conditions. Deferral rates vary regionally, and without follow-up, many deferred donors are lost from the donation pool. A Donor Wellness Clinic (DWC) can help bridge this gap by providing targeted counseling and health interventions to improve donor retention and re-entry. Aims: To analyze whole blood donor deferral patterns, characteristics, and causes at a Northern Indian tertiary care hospital. To assess the impact of a donor wellness clinic on return rates among deferred donors through structured counseling and wellness interventions. Methods: This retrospective study analyzed donor deferral data from September 2023 to August 2024. Additionally, a survey involving 49 participants (donors, deferred donors, medical staff, and lab technicians) was conducted to assess the perceived need for a DWC. From August 2024 to June 2025, deferred donors received follow-up through the DWC for conditions such as anemia, abnormal blood pressure, viral illness, and alcohol intake. Return rates were tracked and analyzed. Results: Out of 3,305 screened donors, 487 (15%) were deferred mainly due to anemia and hypertension. Many deferred donors received targeted health counseling. Initially, return rates were low due to health concerns and lifestyle barriers but improved with sustained follow-up and education. The DWC addressed modifiable deferral causes, improving confidence and enabling re-entry into the donor pool. Conclusion: Donor wellness clinics serve as an effective strategy to reintegrate temporarily deferred donors. By addressing health issues and providing structured support, DWCs enhance donor return rates and optimize blood supply services. Wider implementation across blood banks in India could significantly improve donor retention and transfusion sustainability.

Past Triumphs & Future Horizons
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OP 2

WHEN THE PATTERN DOESN'T FIT: CASE BASED ALGORITHMIC RESOLUTION OF UNUSUAL ANTIBODY SPECIFICITIES IN ROUTINE IMMUNOHEMATOLOGY WORKUPS - CASE SERIES

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Background: In immunohematology laboratories, antibody identification becomes challenging when reactivity patterns do not match known specificities. Antibodies against high/intermediate-frequency antigens like anti-Jk^a, anti-Jk^b, anti-Ch, anti-Bg^a may present with weak, variable, or pan-reactive profiles. Each identification panel comprises cells from different donors, reactivity to low-frequency antigens (LFAs) represented by only one cell can be missed or appear inconsistent. A reactive cell in one lot may be absent/present in another lot, helping support presence of suspected LFA, especially when the rule of three (three positive & three negative antigen-matched reactions) is not feasible. In cases with pan-reactivity and negative autocontrol and DAT, antibodies to high-frequency antigens (HFAs) or plasma protein-associated targets are suspected, use of panel combinations can be extremely helpful. In such cases, combinations of panels and resource-conscious algorithmic approach are essential for accurate identification and safe transfusion. Methods: A structured algorithm was implemented for cases with unresolved/atypical antibody patterns. Following a positive antibody screen, extended identification panels (10,11,14,16) from two different manufacturers/panel lots were used. Enzyme-treated red cells (bromelain, papain, ficin) were used to evaluate enhancement/resistance. Dithiothreitol (0.01M) helped identify antibodies sensitive to sulfhydryl reduction, like anti-Js^a and anti-Js^b. Anti-Chido was suspected when reactivity was retained with 0.2M DTT, lost with bromelain, and confirmed via inhibition using pooled AB plasma. In contrast, anti-Bg^a was suspected when reactivity disappeared after DTT but persisted after bromelain. Suitable blood units were identified by antigen matching or by crossmatch-compatible units transfused in aliquots. Results: Algorithm successfully identified anti-Js^a, anti-Js^b, anti-Ch and anti-Bg^a in 4 complex serologic cases. Chemical modification, enzyme and multiple panel lots enhanced diagnosis and facilitated safe transfusion. Conclusion: A practical, algorithmic approach using extended panels, enzyme and DTT enables identification of antibodies in routine immunohematology labs, improving patient safety and transfusion outcomes.

OP 3

EFFECT OF MULTI-MODAL TRAINING ON KNOWLEDGE AND PRACTICES OF BLOOD TRANSFUSION AMONG NURSES WORKING IN A TERTIARY CARE HOSPITAL: A PROSPECTIVE INTERVENTIONAL STUDY

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Background The complexity of the transfusion process and the need for specialised knowledge highlight the critical role of skilled professionals in ensuring transfusion safety. Nurses, who directly manage patient care during transfusions, must possess a strong scientific understanding and technical expertise to minimise risks and prevent patient harm. However, studies have revealed gaps in nursing competence and shortcomings in transfusion practices, underscoring the need for improved training and protocols. Method This prospective interventional study designed a multimodal training program for nurses, integrating a face-to-face teaching session (FFTS) (first mode) and a self-learning (SL) video (second mode) to address safe blood transfusion practices and transfusion fundamentals. A FFTS covering safe blood transfusion practices, including pre-transfusion sample collection, bedside transfusion, blood component administration, and adverse reaction management, was developed as the first training mode. A 10-minute SL video focusing on pre-transfusion sample collection and bedside practices, served as the second training mode to reinforce key skills was also developed (SL video link: https://youtu.be/Bqg4y8rrHQs?feature=shared). Baseline assessments were conducted to evaluate nurses' knowledge and practices. Knowledge assessment was done via online survey consisting of 33 questions covering various domains: blood components, pre-transfusion checks, bedside transfusion guidelines, adverse transfusion reactions and clinical transfusion. Practices were evaluated by observing 30 pre-transfusion sample collections and bedside transfusion practices, each in high-transfusion-frequency wards. Post-intervention surveys and observations were then used to measure changes and compare outcomes between single-mode (FFTS only) versus multi-mode (FFTS plus SL video) training interventions. Results A total of 666 nurses were recruited as per the inclusion criteria. Baseline knowledge scores (Mean ± S.D.) improved significantly from 21.3 (±3.4) to 25.9 (±2.9) post-single-mode (FFTS) training (p=0.00). Observations revealed significant improvements in pre-transfusion sample collection and bedside transfusion practices post single and multi-mode training interventions. At baseline, the mean score for pre-transfusion sample collection practices was 2.93 (±0.7), and for bedside transfusion practices, it was 15.0 (±1.8). After the single-mode intervention (face-to-face teaching session, FFTS), the mean score for pre-transfusion sample collection practices increased to 3.63 (±1.2), with a p-value of 0.01, indicating statistical significance. Similarly, bedside transfusion practices improved to a mean score of 16.4 (±1.9), with a p-value of 0.008. Following the multi-mode intervention (FFTS plus self-learning video), the mean score for pre-transfusion sample collection practices further increased to 4.7 (±0.9), and bedside transfusion practices reached 20.1 (±0.9), both with p-values of 0.00, indicating highly significant improvements. The multi-mode intervention, which is ongoing, demonstrated greater effectiveness compared to the single-mode intervention. Conclusions The multimodal training program significantly enhanced nurses' knowledge and practices in safe blood transfusion, with multi-mode training (FFTS plus SL video) showing greater effectiveness compared to single-mode training (FFTS alone). These findings highlight the importance of continuing nursing education to sustain critical transfusion competencies and underscore the importance of multimodal education and training approaches for improving competencies in knowledge and transfusion safety.

OP 4

REDUCING ON-SHELF WASTAGE OF FRESH FROZEN PLASMA (FFP) AND CRYOPRECIPITATE IN TERTIARY CARE HOSPITAL BLOOD CENTRE: A CLINICAL AUDIT USING THE PLAN-DO- STUDY-ACT (PDSA) METHOD

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Background: Abstract- Critical blood products like Fresh frozen plasma (FFP) and Cryoprecipitate face significant on-shelf wastage, causing financial loss and potential shortages. Our study at Blood Centre of a Tertiary Care Hospital aimed to reduce this wastage. A Quality Improvement audit showed 2.66% (January - March 2024) baseline wastage. Three iterative Plan-Do-Study-Act (PDSA) cycles addressed root causes (e.g., training gaps, SOP non-adherence) through re-education, updated SOPs, and improved tracking. Subsequent data were analyzed. On-shelf wastage significantly decreased from 2.66% at baseline to 1.03% ($p<0.001$), demonstrating effective intervention. This audit successfully reduced FFP and Cryoprecipitate wastage using iterative PDSA, providing a replicable model. Optimal utilisation requires continuous staff training, SOP adherence, and monitoring. Disseminating these best practices and expanding Quality Improvement initiatives is crucial. Background: Blood products, particularly Fresh frozen plasma (FFP) and Cryoprecipitate are critical resources in healthcare. Ensuring their efficient utilisation and minimising wastage is paramount for patient care. On-shelf wastage of these products remains a significant challenge for blood centres globally, leading to financial losses and potential shortages. While strategies for optimising blood product inventory exist, many institutions continue to experience preventable losses due to various factors. This study aimed to address the specific issue of on-shelf wastage of FFP and Cryoprecipitate units within the Blood Centre of a Tertiary Care Hospital by implementing a structured quality improvement initiative. Method: A Prospective clinical audit was conducted at the tertiary care hospital Blood Centre from January to December 2024. The study comprised three stages: Baseline, Intervention, and post-intervention using Plan-Do-Study-Act (PDSA) method. Study included all FFP and Cryoprecipitate prepared and stored during this period. Outcome: Statistical analysis revealed a significant reduction in FFP and Cryoprecipitate breakage proportion from an intervention value of 2.09% to a post-intervention value of (1.03%, $p< 0.001$), and from a baseline of 2.66% to post-intervention (1.03%, $p< 0.001$). While the initial decrease from baseline (2.66%) to intervention (2.09%) was not statistically significant ($p=0.21$), wastage due to all other reasons demonstrated a statistically significant reduction from baseline (4.96%) to intervention (3.68%, $p=0.04$). Furthermore, the mean wastage of FFP and Cryoprecipitate bags attributable to both breakage and other reasons, showed consistent and statistically significant reductions across the study period ($p= 0.012$ and $p=0.004$ respectively for baseline to post-intervention changes, with Post-Hoc Analysis confirming $p= 0.01$ and $p = 0.001$). Conclusion: This audit provides a valuable blueprint for other blood centers, achieving a significant reduction in on-shelf FFP and Cryoprecipitate wastage via iterative PDSA. Optimal utilization requires staff training, SOP adherence and monitoring. Future efforts must disseminate these best practices and expand similar Quality improvement (QI) initiatives.

OP 5

GRANULOCYTE TRANSFUSION AS A BRIDGING THERAPY FOR PAEDIATRIC PATIENTS UNDERGOING ALLOGENIC HAEMATOPOIETIC STEM CELL TRANSPLANT: OUR EXPERIENCE

Authors:

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Background: Granulocyte transfusion (GTX) is employed as a bridging therapy for managing refractory infections in neutropenic patients, particularly those undergoing chemotherapy or hematopoietic cell transplantation (HCT). The aim is to report our experience on granulocyte transfusion for paediatric patients undergoing allogenic HCTs. Method: Data was collected from hospital records from January 2019 to December 2024. GTX was used to tide over febrile neutropenic phase with or without established infection during peri-transplant course (as single GTX between day+3 to day+5 and/ or ≥2 GTX subsequently in cases with decrement of neutrophil counts till achievement of engraftment and/or resolution of infection). All patients were given Inj. GCSF (5-10mcg/kg) from day+5 till engraftment. For granulocytapheresis, all donors were screened as per national apheresis donor guidelines, checked for venous access and ABO & Rh compatibility. Cell counts (pre-mobilization; after mobilization and mid-procedure) were performed on automated haematology analyser (Beckman Coulter, DxH 520). Mobilization was done using Inj. GCSF (10mcg/kg/s.c.) with dexamethasone (8mg per oral) 12 hours prior to scheduled harvests. All procedures were performed on Spectra Optia apheresis system (Terumo BCT, Lakewood, CO, USA) using peripheral vein or central venous access. Mid-procedure cell counts (at volume=70-90mL) served as procedure end-point with each session aimed to achieve target dose of 6-8 x 108 per kg body weight. All the products were irradiated and stored at room temperature. It was transfused within 24 hours. Descriptive analysis of data was done using IBM SPSS Statistics version 29.0 Armonk, NY: IBM Corp. Results: 182 patients with age ranged from 2 months-18 years underwent HCT for malignant (n=30) and non-malignant (n=152) conditions. They received a total of 304 GTX during the peri-transplant course [1 GTX-(n=71); 2 GTX – (n=87) and ≥3 – (n=19)]. 87.5% were related donors and 12.5% were unrelated. The mean age and weight of the donor were 36.41±8.81 years and 65.43±10.27 kg respectively. Indications in peri-transplant phase included patients with febrile neutropenia post-conditioning regime (n=2) and/or awaiting engraftment post-HCT with or without proven infection (n=182). The donor pre-mobilisation mean WBC count (103/µl) was 7.43±5.54, with mean neutrophil being 41.4±3.4%. Post-mobilisation, mean WBC (103/µl) count was 45.22±27.15 with mean neutrophil being 92.34±8.31%.The mean volume of HES used was 347.15±215.29 ml. It was mixed with 38ml of trisodium citrate which was the anticoagulant. The mean volume of product collected was 275.52±133.58 ml, mean yield being 3.75±1.86 x 1010 per unit and mean dose collected was 12.60±6.53 x 108 per kg. Sixteen donors had citrated related side-effects and two donors had backache and managed conservatively. Mean pre-transfusion absolute neutrophil count (ANC) was 101.49±50.16cells/µl and post-transfusion ANC was 1689.55±1232.65cells/µl. The median dose administered in 182 patients (304 procedures) is 10.3 x 108 per kg with median neutrophil increment 1170 neutrophils/ µl (p= 0.031). Neutrophil engraftment was noted in 91.8% patients with the median days of neutrophil engraftment observed in 14 (9-21) days. None of the patients had any transfusion related adverse event. Conclusion: Overall, prophylactic GTX served as an effective adjunctive therapy in all our patients.

OP 6

STANDARD VOLUME PLASMA EXCHANGE VS HIGH VOLUME PLASMA EXCHANGE IN PATIENTS WITH ACUTE ON CHRONIC LIVER FAILURE

Authors :

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Background: High volume therapeutic plasma exchange (HV-TPE) is a well- established treatment modality in patients with acute liver failure, its efficacy in treating ACLF patients as well as its comparison to standard volume TPE (SV-TPE) yet to be established. The study was conducted with aim to compare the efficacy of HV TPE with SV TPE in ACLF patients. Materials and Methods: A single centre, prospective, randomized pilot study was conducted over two years (2021 to 2023). Twenty-two consecutive ACLF Grade I and II patients without liver transplant prospects were enrolled. Eleven patients underwent HV-TPE and the rest 11 underwent SV-TPE. In addition to tolerability, effect of TPE (HV Vs SV) on biochemical parameters, Cytokine levels (IL-6,10 and TNF-α) and clinical scores (AARC, MDF, MELD, CTP) were compared (pre and post TPE therapy). Hospital stay, 30 day and 90-day mortality rates were also compared between HV Vs SV TPE. Results-Both HV and SV TPE were effective in significant reduction of serum total and conjugated bilirubin, Alkaline Phosphatase, Prothombin time (PT), activated partial thromboplastin time (APTT), International Normalized Ratio (INR) and serum ammonia ($P<0.05$). Serum urea ($P=0.07$), creatinine ($P=0.03$) and serum lactate ($P=0.00$) improved significantly in HV TPE group only. In both groups, there was significant reduction in clinical severity scores- APASL ACLF Research Consortium (AARC), Maddrey's Discriminant Function (MDF) and Model for End-Stage Liver Disease (MELD) ($P< 0.00$). Mortality at 30 day (27% vs 27%, $P=1.00$) and 90 days (36% vs 45%, $p=0.40$) and change in cytokines (IL-6,10 and TNF-α) were not significantly different in the groups. Procedure related adverse events were observed in 6.8% of HV TPE and 5.7% of SV TPE procedures. Conclusion- Both HV and SV TPE are effective in improving clinical severity scores. However, differences in impact on mortality could not be established in our study.

OP 7

ADVOCACY AND IMPLEMENTATION OF TYPE AND SCREEN (TYS) STRATEGY THROUGH HOSPITAL TRANSFUSION COMMITTEE: A TERTIARY HEALTH CARE CENTRE ANALYSIS

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Background: Type and Screen [TYS] strategy [ABO/Rh typing and antibody screening] reduces unnecessary compatibility tests, crossmatch/transfusion ratio [C/T], ensures timely red cell availability. We aimed to implement TYS through Hospital Transfusion committee [HTC] and evaluate RBC [red blood cell] utilization across clinical specialties Methods: A quasi-experimental pre-post observational study was conducted in the Department of IHBT over 18 months [January 2024 to June 2025] in three phases. Phase I, [January to June 2024], baseline C/T ratios were analyzed across seven specialties. Phase II, [July & December 2024], TYS strategy was introduced and implemented through two HTC meetings, involving senior representatives from each specialty. Phase III, [January to June 2025], post-implementation TYS requisitions, red cell utilization, and C/T ratio were collected. The intervention impact on blood utilization was evaluated using descriptive/comparative analyses by SPSS Statistics software. Results: During Phase I, mean C/T ratio were 1.6±1.10 [OBGY], 1.5±1.14 [General Surgery], 1.7±1.51 [Neurosurgery], 1.8±1.21 [Orthopedics], 1.1±1.04 [ICU], 1.4±1.10 [Medicine] and, 1.5±1.18 [Urology]. In Phase II, awareness and implementation of the TYS strategy, including its benefits, logistics, and IT modifications, were facilitated through presentations and simulations. In Phase III, of total 10,843 requisitions, 10.1% (n=1098) were TYS requisitions($p<0.001$). OBGY contributed to 75.18% of them with 20.4% RBC utilization. Neurosurgery and Orthopedics contributed to 4.4% and 1.8% respectively with around 50% utilization. General Surgery 16.09% with 75.7% utilization. ICU, 0.7% with 87.5% utilization. Antibody was positive in six patients (0.54 %): 'Anti-D' in three, and Anti-Lea, Anti-Leb, and Anti-C in others. Post-intervention mean C/T ratios were 1.2±0.07[OBGY], 1.2±0.08[General-Surgery], 1.3±0.01[Neurosurgery], 1.3±0.04 [Orthopedics], 1.1±0.01[ICU], 1.3±0.02[Medicine] and, 1.2±0.01[Urology], with significant reductions in OBGY, General Surgery, and Orthopedics ($p<0.001$).Conclusion: This analysis demonstrated significant impact of TYS on optimized RBC utilization and implementation of new strategies by multidisciplinary involvement through HTC meetings. Future possibility of specialty-specific MSBOS is established.

OP 8

LEVERAGING GENERATIVE AI TO SUPPORT TRANSFUSION MEDICINE EDUCATION: DEVELOPMENT AND VALIDATION OF THE THIRD THINKER STUDENT CHATBOT

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Background: Dr Arun V J Assistant Professor, Department of Transfusion Medicine Malabar Medical College Hospital & Research Centre, Calicut, Kerala, India 673323 Title" Development and Expert Evaluation of an AI Chatbot for Transfusion Medicine Education: A Simulation-Based Pilot Study Background: Transfusion Medicine is a dynamic specialty requiring accurate, evidence-based knowledge for safe practice. Quick fact-checking and access to reliable information are vital for students and trainees. With the emergence of Generative Artificial Intelligence (AI), chatbots can potentially support self-directed learning by providing instant, guideline-based answers. This study describes the development of ThirdthinkerStudent, an AI chatbot trained on curated Transfusion Medicine resources, and its pilot evaluation through expert validation. Methods: The chatbot was developed on the Poe platform and configured to access content extracted from standard Transfusion Medicine PDF sources, including guidelines and textbooks. To assess the accuracy and relevance of the chatbot's responses, 10 representative academic queries covering topics such as donor selection, component therapy, immunohematology, and adverse transfusion reactions were designed by faculty members. The chatbot's answers were recorded for each query and independently evaluated by a panel of three senior Transfusion Medicine experts. Each response was assessed for factual accuracy, alignment with accepted guidelines, and educational usefulness, using a standardized scoring rubric (0–5 scale for each domain; maximum score 15). Mean scores were calculated for overall performance. Results: The chatbot responded to all 10 queries without errors in retrieval. Expert evaluation showed that 90% of responses scored ≥12 out of 15, indicating high accuracy and strong alignment with standard references. Experts noted that the tool could reliably reinforce textbook concepts and aid students in clarifying doubts outside classroom hours. However, they recommended clear disclaimers to emphasize that the chatbot is a supplementary educational tool, not a substitute for faculty guidance. Conclusion: The pilot study demonstrates the feasibility of deploying AI chatbots for knowledge support in Transfusion Medicine and highlights the need for continuous content updates and expert oversight to maintain reliability. Future work will expand question sets and integrate user feedback to enhance the tool's effectiveness. As AI in developing at a fast rate, it can help make teaching, learning and disseminating knowledge much faster and easier.

OP 9

UNVEILING THE HIDDEN RHD: A PROPOSED ALGORITHM FOR DETECTING WEAK D, PARTIAL D, AND DEL PHENOTYPES IN RHD-NEGATIVE BLOOD DONORS — A SINGLE CENTRE STUDY

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Background: The Rh blood group system is highly polymorphic and clinically significant, second only to ABO in transfusion medicine. The D antigen is immunogenic and central to transfusion practice, but Weak D, Partial D, and Del variants complicate typing due to altered antigen expression. Indian protocols recommend two anti-D reagents but lack guidance on clone selection, risking misclassification and alloimmunization. The study aimed to evaluate current serological strategies adequately detect D variant phenotypes among Indian donors, determine their prevalence, and develop a refined algorithm to improve detection and transfusion safety. Methodology: This prospective observational study was conducted from April 2023 to November 2024 at a tertiary care hospital in Delhi, India. 349 blood donors initially typed as RhD-negative were included. RhD typing was performed on the NEO Iris® automated platform using two antisera, Novaclone and D Series 5, as per current protocol by Indian guidelines. Donors typed as RhD-negative underwent reflex weak D testing by IAT phase on the same platform. Additionally, all donors were Rh phenotyped using anti-C, anti-c, anti-E, and anti-e reagents. The proposed algorithm was implemented where samples that were negative or weakly reactive (<2+ agglutination) were evaluated using additional testing with two anti-D antisera (IgG & IgM blends) from different lots of the same manufacturer to check accuracy and reproducibility. Additional weak D testing was performed using anti-D IgG clone ESD1 in gel cards. All negative or weakly positive samples were tested for Partial D typing using the Bio-Rad Partial RhD Typing Set (clones LHM59/19, LHM70/45, LHM76/55, LHM77/64, LDM1) for precise serological characterization. Del phenotype detection employed the heat elution method: donor red cells were incubated with a anti-D reagent, washed, heated at 56°C for 10 minutes to elute bound anti-D, and the eluate tested for reactivity. Results: Of 349 donors, 334 (96%) were confirmed as true RhD-negative, while 15 (4%) were identified as variant D phenotypes: 9 Partial D (2.6%), 3 Weak D (0.9%), and 2 Del (0.6%). Among Partial D cases, DIII was most common (44.4%), followed by DVII, DFR, DHAR, DBT, and DV (each 11.1%). A statistically significant association was observed between variant D phenotypes and Rhce antigen expression ($p < 0.05$), with nearly all Partial D and Weak D cases exhibiting Ccee phenotype, while Del was restricted to ccee phenotype. Assessment of monoclonal anti-D clones revealed clone LHM70/45 had the highest detection rate (2.86%), followed by LHM76/55 and LHM77/64 (2.57% each). Clones LDM1 and ESD1 contributed to detection at lower frequencies. Novaclone (D175-2 and D415 1E4) and D Series 5 (TH28+MS26) failed to detect any variant D cases. Testing with two different lots of antisera from the same manufacturer (P3x61, NaTH119, LOR 15C9), as per regulatory guidelines, showed no improvement in detection. The enhanced detection with the proposed algorithm was statistically significant ($p < 0.05$), demonstrating its superior sensitivity. Conclusion: About 4% of donors initially classified as RhD-negative carried clinically significant variant D phenotypes. Implementing a refined algorithm with sensitive monoclonal clones and confirmatory tests improves detection accuracy and enhances transfusion safety.

OP 10

MANIPULATED DLI – EVOLVING TRANSFUSION SUPPORT AND FUTURE IMPLICATIONS IN THE MANAGEMENT OF HSCT PATIENTS RECEIVING MANIPULATED DONOR LYMPHOCYTE INFUSION

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BACKGROUND: Donor lymphocyte infusions (DLIs) are an effective modality to induce graft versus leukemia (GvL) effect, reduce graft vs host disease (GvHD) and prevent infections in haploidentical Hematopoietic Stem Cell Transplant (HSCT) patients. T-cell depleted (manipulated) DLI have the potential to reduce GvHD, reduce transfusion requirements and prevent disease relapse. Manipulation of DLI, their cryopreservation and transfusion support in these patients can pose significant challenges to blood centers. Limited data is available regarding transfusion support in patients receiving manipulated DLI. The objectives of this study were to analyze Packed Red Blood Cells (PRBC) and Single Donor Platelet (SDP) transfusion in haploidentical HSCT patients receiving manipulated DLI, duration of cryopreservation of DLI and the average viability of DLI post thaw. METHODOLOGY : This was a retrospective observational study conducted from April 2023 - May 2025. Data was retrieved from electronic medical records (EMR) and Departmental records from Department of Transfusion Medicine and Department of Medical Oncology. Demographic data and transfusion trends among haploidentical HSCT patients receiving manipulated DLI were analyzed. PRBC and SDP transfusion within 100 days post transplant and within 30 days post DLI transfusion were analyzed. Number of days DLI were cryopreserved and average viability of cells after thawing DLI were analysed. OUTCOME : During the study period, there were 24 haploidentical stem cell transplant patients who received manipulated DLI post transplant. Out of these, 14 (58%) were male and 10 (41%) were female. Mean age was 27.8 (range 4-56) years. There were a total of 86 DLI transfused to the 24 patients. Mean viability of DLI post thaw was 94% by trypan blue dye exclusion method. Patients were transfused 3.5 DLI on average during the study period. In the 30 days following the first DLI transfusion, patients required 0.6 and 0.8 PRBC and SDP respectively with the number of transfusions decreasing in the 30-day period following subsequent DLIs. In the first 100 days post-transplant, patients were transfused 2.1 DLI on average and required median 2 units PRBC and 3.5 units SDP respectively. The average duration of cryopreservation was 97.8 (28-622) days. CONCLUSION : In a prior study conducted by Patle et al. at our institute, haploidentical HSCT patients not receiving manipulated DLI required median 4 PRBC and 7 SDP units in the post transplant period. In contrast, patients in the current study required median 2 PRBC and 3.5 SDP units. This decrease could be attributed in part to the introduction of manipulated DLI, along with better optimization of blood components. The processes of T-cell depletion and cryopreservation of DLI for long periods require technical expertise and have added costs. A study like this can help in management of blood inventory and plan treatment costs of an HSCT program.

OP 11

TO EVALUATE THE ACCURACY OF A PB CD34+ AND CEC(%) BASED PREDICTION TOOL WITH A SIMPLE POPULAR PB CD34+ BASED TOOL FOR ESTIMATING BLOOD VOLUME TO BE PROCESSED FOR AUTOLOGOUS AND ALLOGENEIC PBSC COLLECTIONS

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Background: Engraftment in HSCT depends on the number of CD34+ cells infused, which is influenced by the apheresis device's collection efficiency (CEC%) and the blood volume processed. Current prediction tools don't fully account for how device collection efficiency changes. This means we might process too much or too little blood. We need a new tool. It should predict the right blood volume based on CD34+ counts, device CEC%, individual blood volume, and recipient weight. This will help us collect the right amount of stem cells every time. CEC values vary by device, software, center, and procedure, and may change over time, potentially leading to under- or overestimation of the volume needed to achieve the target stem cell dose. Study Design and Methods: A prospective observational study was conducted from August 2023 to May 2025 in a 650 bedded multispeciality hospital in India.Total volume to be processed was calculated using the two customized prediction tools. In Tool 1 PB CD34+ count and CEC as the dependent variables and then the recipient's weight and was calculated using following formula Number of CD34+ yield (cells×106/kg)=(Peripheral blood CD34+ cells/µL)× mCEC%*)/ Recipient body weight (kg) x Total blood volume processed (L). Tool 2 used only PB CD34+ as the dependent variable, used formula Collected CD34 + cell concentration×(106/L) = (a × pre CD34 + cell concentration) + b where a=slope and b= intercept. Results :Out of 118 stem cell collections,72-allogeneic,46-autologous.Using Tool 1 predicted processed volume was around 16.76 L for allogeneic and 16.73 L for autologous donors, while actual volumes were slightly lower at 14.81 L and 14.59 L respectively, with moderate but significant correlations (R^2 = 0.315 and 0.399, p < 0.001), suggesting a reasonable match. Tool 2 estimated a higher volume of 17.47 L for allogeneic donors and a lower 13.75 L for autologous ones, compared to their actuals of 14.81 L and 14.59 L, the correlations were moderate in the allogeneic group(R^2=0.316) and stronger in the autologous group (R^2=0.556), both statistically significant. When it came to predicting CD34+ cell doses, Tool 1 with predicted and actual values closely matching in both allogeneic (19.97 vs 20.32 ×10^6/kg, R^2= 0.825) and autologous (10.23 vs 9.40 ×10^6/kg, R^2=0.819) donors. Tool 2 also showed strong accuracy, predicting 16.89 ×10^6/kg in allogeneic and 10.08 ×10^6/kg in autologous donors, both closely aligning with actual doses and showing strong correlations (R^2=0.834 and 0.893),with statistically significant (p < 0.001),confirming the predictive strength of both tools. Tool 1 demonstrated a slightly higher accuracy in predicting volume (51.7%) compared to Tool 2 (42.4%), with the difference being statistically insignificant (p = 0.09).However, for CD34 dose prediction, Tool 2 showed markedly higher accuracy (73.7%) than Tool 1 (53.4%), which was statistically significant (p < 0.001). Outcome:Both the tools accurately predicted the blood volume to be processed. This can reduce extra procedure time and ACD use,reducing citrate toxicity Conclusion:While both prediction tools showed accuracy in estimating processed blood volume, Tool 2,which relied solely on initial peripheral blood CD34+ counts, demonstrated significantly

OP 12

AN AUDIT ON EFFICACY OF SELECTIVE DEPLETION OF AB T CELLS USING CLINIMACS PRODIGY FOR HAPLOIDENTICAL HEMATOPOIETIC STEM CELL TRANSPLANTATION – AN INSTITUTIONAL EXPERIENCE

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Background: Donor-derived T cells expressing the αβ T-cell receptor (TCR) are the primary mediators of graft-versus-host disease (GVHD) following allogeneic hematopoietic stem cell transplantation (allo-HSCT). Selective depletion of αβ TCR T cells and CD19+ B cells from the donor graft reduces the risk of GVHD while preserving beneficial immune subsets such as CD34+ hematopoietic stem cells, γδ TCR T cells, and natural killer (NK) cells. This strategy facilitates engraftment, supports immune reconstitution, and retains graft-versus-leukemia and anti-infective responses. Aim: To evaluate the efficacy and performance metrics of the CliniMACS Prodigy system for selective αβ TCR and/or CD19+ depletion from donor stem cell grafts, with focus on depletion efficiency and recovery of desired cell populations. Methods: This retrospective analysis included 20 CliniMACS Prodigy–processed stem cell apheresis procedures for αβ TCR and/or CD19+ depletion. Complete blood count and flow cytometric phenotyping (CD45, CD3, TCR αβ, CD4, CD8, TCR γδ, CD20, CD56) was conducted pre- and post-processing. Key parameters evaluated included log reduction of αβ T cells and CD19+ B cells, and recovery rates of CD34+ cells, γδ TCR T cells, and NK (CD56+) cells. Results were expressed as mean (SD), and linear regression analysis was performed to assess correlations between input cell composition and depletion efficiency. Results: Of the 20 procedures, 13 (65%) involved both αβ TCR and CD19 depletion, while 7 (35%) involved αβ TCR depletion only. Pre-processing mean counts of αβ TCR and CD19+ cells were 66,915 and 20,291, respectively, reduced to 7.3 and 6.7 post-processing. Mean log reduction was 4.3 log (SD: 0.7) for αβ T cells and 3.8 log (SD: 0.4) for CD19+ B cells. Mean recovery rates for CD34+, γδ TCR, and NK cells were 80.3% (SD: 10.2%), 74.4% (SD: 21.9%), and 53.7% (SD: 25.8%), respectively. Interestingly, high baseline platelet counts were found to moderately negatively correlate with αβ T cell depletion efficacy ($r = –0.50$, $p = 0.035$), suggesting a potential impact on magnetic sorting efficiency. Conclusion: Selective depletion of αβ TCR and CD19+ cells using the CliniMACS Prodigy platform demonstrated robust depletion efficiencies and satisfactory recovery of critical immune effector cells, supporting its reliability in haploidentical HSCT settings. The system preserves desirable graft components while effectively mitigating GVHD risk. However, elevated platelet content in the apheresis product may impair T cell depletion efficiency, highlighting the need for preprocessing optimization in high-platelet samples. Importantly, this audit represents the first research output from India utilizing the CliniMACS Prodigy system for TCRαβ depletion, marking a significant advancement for the implementation of advanced graft engineering technologies in the region.

OP 13

A RETROSPECTIVE ANALYSIS OF AUTOMATED RED CELL EXCHANGE ON CLINICAL EFFICACY AND OUTCOMES IN A TERTIARY CARE CENTER IN EASTERN INDIA.

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Background: Abstract Background and Aims Sickle Cell Disease (SCD) is a common hemoglobin disorder in India, particularly in Odisha, leading to significant morbidity, mortality, and substantial financial burden. This genetic mutation causes the production of abnormal hemoglobin S (HbS), which can polymerize under low-oxygen conditions, resulting in vaso-occlusive crises (VOC), acute chest syndrome (ACS), and strokes. Hydroxyurea is the primary pharmacological treatment; however, blood transfusions, including simple and red cell exchange (RCE), are vital during crises. RCE specifically helps to reduce HbS levels, and research suggests that keeping HbS below 30% can significantly decrease the frequency of crises. This study aimed to retrospectively evaluate the effectiveness of Automated RCE at our institute for managing various complications associated with SCD. Methods A retrospective analysis was performed on 27 Automated RCE procedures conducted on patients with SCD using the Spectra Optia (Terumo BCT) instrument. The replacement fluid consisted of Rh and Kell-matched, leukoreduced, HbS-negative packed red blood cells (PRBCs) with a hematocrit of 55% to 60%, ensuring a total fluid balance of 100% PRBCs. The total blood volume for the exchange was calculated based on pre- and post-procedure hemoglobin (Hb) and HbS levels, with target post-procedure levels set at HbS <30% and Hb 10 g/dL. Collected data included patient demographics, clinical indications, vascular access, technical issues, HbS reduction, fractional cell removal (FCR), adverse events, and relevant biochemical parameters. Results The cohort comprised 27 patients (59.3% male; mean age 29.6 years, range 16-54). The primary indications for RCE included avascular necrosis (AVN) of the hip (25.9%), orthopedic complications (18.5%), and hepatobiliary issues (11.1%), along with cases of acute chest syndrome, vaso-occlusive crises, leg ulcers, and ischemic strokes. Most patients underwent a single RCE session, while one case required two sessions. The Internal Jugular Vein was the most common vascular access site (37.0%). Technical issues occurred in 2 procedures (7.4%). RCE effectively reduced HbS levels from a pre-exchange range of 72-90% to a post-exchange range of 31-53.1%, achieving FCR rates between 30% and 52%. Adverse events were observed in 5 patients (18.5%), mainly consisting of hypotension, chills, vomiting, and febrile non-hemolytic transfusion reactions, which were managed with procedural adjustments and symptomatic careAnti-CW and Anti-Jkb alloantibodies were detected in one patient following the RCE procedure. Conclusions Automated RCE demonstrated significant effectiveness in reducing HbS levels and was associated with favorable clinical outcomes for various SCD complications. Notably, 55.5% of the procedures were performed pre-operatively, with no post-surgical crises reported. A patient with acute chest syndrome was discharged symptom-free within 9 days, and a patient with an ischemic stroke exhibited significant neurological improvement (power increased from 0/5 to 3/5) and was able to ambulate with support within one month. Furthermore, a chronic venous ulcer patient achieved over 50% wound healing after two RCE sessions in just three weeks. These findings underscore Automated RCE as a safe and effective therapeutic intervention for managing SCD complications within an Eastern Indian tertiary care setting.

OP 14

UNSEEN, UNHEARD, UNVEILED: UNMASKING SICKLE CELL DISORDERS IN BLOOD DONORS AND THEIR IMPACT ON QUALITY CONTROL OF BLOOD COMPONENTS IN AN EASTERN INDIAN TERTIARY CARE FACILITY

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BACKGROUND: Sickle cell disorder(SCD) is a common inherited hemoglobinopathy worldwide, with high prevalence in India's central and eastern states,including Odisha. Hemoglobin S (HbS), which is caused by a point mutation in the β-globin gene, makes red blood cells stiff and sickle-shaped when oxygen levels are low. This can result in hemolysis,vaso-occlusion and problems affecting several organs.While sickle cell disease manifests clinically,individuals with sickle cell trait(heterozygous carriers) remain asymptomatic and unaware of their status. However,their blood poses potential risks when transfused into patients with sickle cell disease,neonates,or those requiring exchange transfusions,due to reduced deformability and possible sickling under stress.In blood centres,sickle cell trait in donor units can affect blood component quality,filtration,and storage,compromising transfusion safety standards. Despite this relevance,data on SCD prevalence among blood donors remains limited. Determining this prevalence and assessing its impact on blood component quality control are crucial for effective donor screening strategies and optimal patient outcomes. The aim of the study was to assess the prevalence of sickle cell disorder among blood donors and its impact on quality control of blood components in an Eastern Indian tertiary care facility. METHODS:A cross-sectional analytical study was conducted in the Immunohematology lab of Department of Transfusion Medicine of an Eastern Indian tertiary care facility from 1st April'25 to 8th June'25. Study included whole blood donors who satisfy the requirements set forth in 1940 Drugs and Cosmetics Act Government of India to donate blood. After obtaining informed consent,donor blood samples were collected in EDTA vials. The screening for sickle cell disorder was performed using sodium metabisulfite solubility test as a rapid tool. Samples which tested sickling positive formed the study group and determined the prevalence ratio of the study while sickling negative donors were selected as the control group. Corresponding PRBC,RDP and FFP donor units were further assessed for quality control parameters to evaluate any significant impact on blood component quality as per departmental SOP. PRBC units were tested for appearance,volume, hematocrit and sterility. RDP units were tested for appearance,volume,platelet count,pH,RBC and WBC contamination along with sterility and FFP units were tested for appearance,volume,factor I and factor VIII. These QC parameters of study group were compared with control group. RESULTS:A total of 4540 whole blood donors were screened during the study period. Amongst them 72 tested positive for the sickling solubility test. The overall prevalence ratio (trait and disease) was found to be 1.58% with the highest prevalence observed in male gender. The sickling positive donors mostly belonged to age group ranging from 20 to 40 years. Out of the total sickling positive donors,2 were pricked twice during donation process due to obstructed flow during blood collection.2 units faced difficulty during PRBC separation. A preliminary observation suggested a potential impact on certain component quality aspects such as volume and count. CONCLUSIONS:This study underscores the importance of targeted screening and quality control vigilance to ensure that blood meant to save lives does not inadvertently compromise patient outcomes,thereby enhancing the overall standards of transfusion services in tertiary care hospitals catering to diverse and high-risk populations.

OP 15

PRECISION IN PANIC: THE ROLE OF BIOLOGICAL CROSSMATCH IN AIHA BLOOD CRISIS

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Background: In emergency situations, patients who urgently need blood transfusion such as those with autoimmune hemolytic anemia (AIHA) or multiple alloantibodies often present a major challenge: none of the available blood units are compatible in standard pretransfusion testing. This is usually due to the presence of antibodies that react broadly with most donor red cells, making it difficult to find a “perfect match.” When time is critical and the patient's life is at risk, waiting for full compatibility is sometimes not an option. In such cases, biological crossmatch offers a practical and potentially life-saving solution. It involves transfusing the “least incompatible” unit while closely monitoring the patient's response clinically and through lab markers to ensure that the transfusion is tolerated and effective. While it's not a replacement for routine compatibility testing, biological crossmatch plays a crucial role when quick decisions must be made, helping clinicians safely proceed with transfusion even in the most complex scenarios. Aim: To evaluate the safety and effectiveness of transfusion of 'best matched' red cells by biological crossmatch in case of blood need in emergency situation. Methodology: In this study a total of 25 patients were included for whom crossmatch compatible red cell units could not be found. Such patients were issued best matched red cell units after consulting the clinicians. All units were transfused by in vivo biological crossmatch which was done at the patient's bedside. Initially patients were transfused 10-15ml of red cells and were closely observed for 10-15 minutes for any adverse transfusion reaction that could develop. In absence of any adverse reactions, the transfusion was again started and closely monitored throughout. Clinical condition of the patient pre- and post- transfusion was assessed. Laboratory parameters of hemolysis such as serum LDH, serum bilirubin,etc. were also assessed before and 12 hours after transfusion. Outcome: All the transfusions were uneventful and completed successfully. There was a significant rise in hemoglobin levels and hematocrit levels ($P<0.001$) post transfusion. The laboratory hemolytic parameters like serum LDH and serum bilirubin were found to be statistically comparable pre- and post- transfusion. Conclusion: Biological crossmatch proved to be a safe and effective approach for emergency transfusion in patients where compatible red cell units could not be identified through conventional methods. All patients tolerated the transfusion well, with no adverse reactions observed. The significant improvement in hemoglobin and hematocrit levels, along with stable hemolysis markers, highlights the clinical value of issuing best-matched units based on biological crossmatch in critical scenarios. This strategy can serve as a vital tool in managing complex transfusion needs, especially when time-sensitive intervention is required.

OP 16

A COMPREHENSIVE APPROACH TO MANAGING ALLOIMMUNIZATION IN FEMALES WITH BAD OBSTETRIC HISTORY: EXPERIENCE FROM A TRANSFUSION MEDICINE SPECIALIZED REFERRAL CENTRE

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Background: Bad obstetric history (BOH) increases the risk of pregnancy complications. Alloimmunization against fetal red blood cell antigens can cause hemolytic disease of the fetus and newborn (HDFN), requiring early detection, close monitoring, and timely intervention. However, in resource-constraint settings, limited access to specialized testing and expertise contributes to the challenge of HDFN, leading to pregnancy complications and eventually BOH. Aims: This study reports management and outcomes of alloimmunized BOH patients at a specialized referral center to guide establishment of similar centers for improved maternal and fetal outcomes. Methods: This prospective study was conducted at a tertiary healthcare center from August 2016 to August 2024 by the Department of Transfusion Medicine and Fetal Medicine. A specialized referral center was developed to provide immunohematological evaluation and help in the management of BOH patients referred by fetal medicine specialists. All referred patients underwent blood grouping and antibody screening as a part of baseline investigations. If positive, patient was enrolled, detailed history was taken, investigations including antibody identification and titration were performed and referring specialist was alerted. Antenatal cases were closely monitored using ultrasound and Doppler studies, with weekly middle cerebral artery peak systolic velocity (MCA-PSV) assessments to detect fetal anemia. If MCA-PSV exceeded 1.5 multiples of the median (MoM) or fetal hydrops was observed, intervention was initiated as per departmental protocol, including fetal blood sampling, intrauterine transfusion (IUT), therapeutic plasma exchange (TPE), and intravenous immunoglobulin (IVIG). All demographic data, laboratory data and data of interventions was recorded. All patients were followed up for pregnancy outcomes and newborn exchange transfusion requirements. Results: Over eight years, 848 patients were referred by 11 fetal medicine specialists for antibody screening. Of 848 screened, 54.5% (462) had unexpected antibodies. The average maternal age of this group was 31.88 years (SD: 4.52, range: 24–45 years). IUT was required in 66.7% (308/462) of alloimmunized patients. Anti-D was the most common antibody (72%, 222/308), either alone or in combination. Anti-C was the second most frequent (24.4%, 75/308), often with Anti-D. Other antibodies, including Anti-Jka, Anti-E, Anti-S, and Anti-K, were also detected, with some patients having multiple antibodies. The earliest IUT was performed at 17 weeks. A total of 784 units were provided for IUT (average: 2.55 per patient, range: 1–6). Three patients underwent TPE due to high maternal antibody titers and severe fetal anemia requiring unusually frequent transfusions. An average of 2.7 sessions were given to these patients. Although IVIG was offered, it was not used. Nearly 11% (34/308) of patients developed new antibodies, most commonly Anti-Jka, particularly in those with multiple antibodies at presentation. Over 90% of these pregnancies had successful outcomes. Most newborns did not require exchange transfusion due to well-timed IUT. Summary / Conclusions: Early detection, close monitoring, and timely intervention significantly improve pregnancy outcomes in alloimmunized BOH patients. High prevalence of Anti-C, along with multiple alloantibodies, highlights need for early referrals, individualized treatment, and strict RhD prophylaxis. A collaborative approach between transfusion medicine and fetal medicine is crucial for optimizing care and improving outcomes.

OP 17

THE FIRST CRITICAL STEP: LEUKAPHERESIS FOR CHIMERIC ANTIGEN RECEPTOR (CAR) T- CELL THERAPY, REAL WORLD EXPERIENCE FROM A QUATERNARY CARE CENTER IN INDIA

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Background: Chimeric Antigen Receptor (CAR) T-cell therapy has emerged as a novel immunotherapeutic modality for relapsed and refractory hematologic malignancies. A critical prerequisite for CAR T-cell manufacturing is the optimal collection of T lymphocytes via leukapheresis. However, the efficiency of leukapheresis can vary significantly based on pre-apheresis patient characteristics, prior therapy, and collection platform. This study aims to evaluate real-world outcomes of peripheral blood (PB) leukapheresis in Indian patients undergoing CD19-directed CAR-T therapy, focusing on collection efficiency (CE), yield, and correlations with peripheral blood parameters. Methodology This was a prospective observational study in which a total of 13 patients with relapsed/refractory (r/r) Diffuse Large B-Cell Lymphoma (DLBCL) or B-Acute Lymphoblastic Leukaemia (B-ALL) were included. One patient underwent second leukapheresis procedure following disease relapse, resulting in a total of 14 procedures. The target ALC of harvested product was kept as per manufacturer's criteria (1 x 109 {Auxi} and 2 x109 {Talicabtagene Autoleucel, Indigenous}).All procedures were performed on Spectra Optia (Terumo BCT) automated cell separator. Debulking therapy was stopped 1 -3 weeks prior to harvest to ensure T-cell fitness. Pre harvest assessment included TLC (Total leukocyte count), ALC, and CD3 enumeration for both patients and products. PB lymphocytes were harvested from non-mobilized patients and collection efficiency (CE) was calculated .Clinical responses were assessed on day 30 following post CAR T-cell infusion. Ethical clearance was taken from the institute body. Outcome A total of 14 leukapheresis procedures in 13 patients were analysed, including one repeat procedure in a patient for CAR-T cell therapy post relapse. Seven patients had r/r DLBCL and six patients had r/r B-ALL. Mean Total blood volume (TBV) processed, CE, product volume was 2.1 (± .48), 43.95 % (± 10.97), 179.64 ml (±15.21) respectively. Median ALC of the harvested product was 3.16 x 109 (.78 x 109 -14.7 x 109). A statistically significant correlation was observed between PB ALC and ALC of harvested product ($r = 0.89$, $p < 0.005$). Adequate dose was achieved in 13 out of 14 leukapheresis procedures. There was suboptimal ALC harvest dose in one patient which led to failure of CAR T-cell manufacturing. Among 13 patients who underwent leukapheresis, two patients succumbed to pneumonia post leukapheresis and 11 patient were infused with CAR T-cells. Nine patients received Indigenous CAR T-cell and two patients received Malaysian CAR T-cell (Auxi Therapeutics). Response rates at day 30 for B-ALL were: 5/6 achieved MRD negative complete response (CR) and 1 Partial response (PR) and for DLBCL were: 2 complete response (CR), 1 Partial response (PR). 1 Stable disease (SD), 1 Progressive disease (PD), Conclusions Peripheral blood leukapheresis for CAR T-cell manufacturing was feasible and successful in majority of patients, achieving target lymphocyte yields in 93% of the procedures in real world settings. Favourable early clinical responses were observed in both DLBCL and B-ALL.

OP 18

TO UNDERSTAND TRANSFUSION SUPPORT AND DETERMINE FACTORS AFFECTING OUTCOME OF HEMATOPOIETIC STEM CELL TRANSPLANT IN PATIENTS WITH SICKLE CELL DISEASE – A PROSPECTIVE STUDY

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Background: The aims and objectives were to understand transfusion support requirements and determine factors affecting the outcome of HSCT in this cohort wherein outcome was prospectively studied in terms of event free survival (EFS) - event being defined as primary graft failure or death within the duration up to day+100 following transplantation. Material & Methods: Present study was undertaken in department of transfusion medicine in collaboration with department of bone marrow transplant and cellular therapy for the period of one year (July 2023 – June 2024). A minimum of 37 patients were enrolled based on statistical justification. Inclusion criteria encompassed SCD patients undergoing first-time HSCT; those refusing consent or undergoing repeat transplants were excluded. Pre-transplant protocols included high-resolution HLA typing, donor-specific antibody testing, red cell alloimmunization workup, automated red cell exchange, and autologous stem cell backup. Transplant regimens followed the 'Apollo Protocol' involving pre-transplant immunosuppression (PTIS), augmented conditioning (Thio-Flu-Cy-ATG-TBI), and GvHD prophylaxis (Post-Cy, Sirolimus, MMF). Donors received GCSF (10 mcg/kg/day-s.c.) ± Plerixafor (0.24mg/kg/day – s.c.) for mobilization. CD34+ and CD3+ enumeration was performed via flow cytometry. Post-transplant characteristics including engraftment, chimerism, immune reconstitution, and complications such as infections or acute GvHD were closely monitored. Statistical analysis was conducted using SPSS v29.0, with $p<0.05$ considered significant. Results: A total of 37 patients were enrolled with gender distribution as - male 52% (N=19) and female 48% (18) having mean age at diagnosis: 1.8 ± 3.3 years. All had good performance status (Lansky/Karnofsky ≥90). Most common indication for HSCT was recurrent VOCs/Pain (51.4%), VOCs + ACS/AVN (24.3%) and others (24.3%). History of transfusions was present in 91.9% (34/37), however, 18.9% were alloimmunized. HSCT donor type noted were- Haploidentical: 64.9% (n=24)>MSD/MRD: 27% (n=10)> MUD: 8.1% (n=3). Transfusion Support was studied based on ABO Match, Type of Stem cell transplant donor and alloimmunization. We observed that the highest median (IQR) PRBC and Platelet Concentrate were required maximum by Major ABO incompatible recipients [6 (2-6)]; MUD recipients [11.0 (5.0-11.0)] and alloimmunized patients [5 (3-12)]. None of the patients required FFP or cryoprecipitate. Granulocyte support was required more commonly in MUD [2 (2-2)] and alloimmunized [2(1-2)] patients. Neutrophil and platelet engraftment occurred at median 14 and 18.5 days respectively. The median with IQR on day +100 as noted were - 99.6 (98.1-100.0); 99.6 (98.1-100.0); 100 (99.3-100.0) and 100 (94.9-100.0). Post-transplant complications included Grade III-IV mucositis (27.0%), CRS (Grade I–27.0%, II–10.8%, III–5.4%), engraftment syndrome (10.8%), fungal (10.8%) and bacterial infections (5.4%), BK/adenovirus (24.3%), CMV reactivation (62.1%), VOD (10.8%), and Grade II-IV aGvHD (10.8%). At a follow up of day+ 100 days, thirty-three patients were alive and disease-free making overall survival (OS) of 89.2%. The median Hb levels and HbS levels post-transplant at day +100 were 10.7 gm/dl (range 9.2 - 13.1) and 25.1% (range 0% to 32.3%). Conclusion: Transfusion needs were higher in MUD and alloimmunized groups. Outcomes were superior in MSD/MRD transplants and significantly influenced by patient age and co-morbidity status. No significant impact was observed from ABO mismatch, alloimmunization, or CMV reactivation.

OP 19

STUDY OF EFFECT OF BLOOD DONOR CHARACTERISTICS AND COMPONENT PROCESSING METHODS ON PLATELET DERIVED MICROPARTICLES USING FLOWCYTOMETRIC AND PROTEOMIC APPROACH AND CLINICAL IMPLICATIONS

Authors:

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Background: In transfusion medicine, microparticles (MPs) particularly Platelet derived MPs (PMPs) have attracted significant attention due to their biological activity and potential to influence transfusion-related outcomes. PMPs, enriched with pro-coagulant phospholipids and bioactive proteins, can interact with recipient cells and modulate physiological processes post-transfusion. Elevated PMP levels in stored blood components have been associated with thromboembolic events, transfusion related immunomodulation (TRIM), allergic reactions, and transfusion-related acute lung injury (TRALI). Given these clinical concerns, monitoring PMP levels in blood components is vital for enhancing transfusion safety. Blood component preparation methods, such as Buffy Coat (BC), Platelet-Rich Plasma (PRP), and Apheresis (AP), influence PMP concentrations, likely through varying degrees of platelet activation during processing. Additionally, PMP levels increase progressively during storage, further impacting the safety and efficacy of transfused products. Aim: To understand PMP formation dynamics by analysing the donor characteristics and processing methods to improve transfusion outcomes. Objectives: 1. To evaluate the effect of donor characteristics on the baseline PMP concentrations. 2. To investigate the influence of different processing methods and storage on the PMP concentrations. 3. To analyse the clinical outcomes of PMP transfusion Method: Baseline PMP levels: Sample collected from blood donors and PMP levels enumerated and analysis done based on age, gender, blood pressure, and haematological parameters. PMP levels after processing and storage: Samples were collected on day 0 and day 5 for PMP enumeration after blood component preparation methods, such as Buffy Coat (BC), Platelet-Rich Plasma (PRP), and Apheresis (AP). Clinical implications: All transfusion outcomes were monitored and adverse events correlated with the PMP levels. Processing for PMP: Platelet-free plasma (PFP) was obtained by centrifuging blood at 3,000×g for 15 minutes at room temperature. MPs were isolated by sequential centrifugation at 20,000×g and 60,000×g for 30 minutes each. The MP pellet from each step was reconstituted by vortex mixing with 0.5–1 mL Hanks'/HEPES buffer. Quantification of MPs: ELISA for PMP Detection: Samples and standards were run in duplicate, sequentially incubated with diluent, biotinylated antibody, Streptavidin-HRP, and TMB substrate at 37°C with intermediate washes. Absorbance was measured at 450 nm after adding the stop solution. Flow Cytometry for PMP enumeration: conducted using CD61-PE-labeled antibodies to quantify PMPs. The positivity percentage of CD61+ MPs was recorded for each preparation and storage condition. Statistical Analysis PMP data were expressed as median (interquartile range) and compared using the Mann Whitney U test. Normally distributed values were expressed as mean ±SD and analysed by Student's t-test. A p-value ≤0.05 was considered statistically significant. Summary / Conclusions: Apheresis yielded the highest PMP levels, Buffy Coat had lowest levels due to cushioning effect of processing. Apheresis samples consistently exhibited higher PMP concentrations at all time points. ELISA appears as a cost-effective option for routine PMP screening in the blood transfusion services. Most of the transfusion reactions during the study period was seen in the platelet concentrate processed by apheresis or platelet rich plasma method, probably due to higher microparticle counts

OP 20

EFFICACY OF CASCADE PLASMAPHERESIS (EVAFLUX ®) IN HLA INCOMPATIBLE RENAL TRANSPLANTATION – A TERTIARY CENTRE EXPERIENCE

Authors :

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Background: Advanced desensitization protocols have now made renal transplantation plausible in patients despite ABO or HLA incompatibility. Identification of donor specific antibodies (DSA) in recipient's plasma using a semi-quantitative method- single antigen bead assay (SAB) in recipients, expressed as mean fluorescence intensity (MFI), is the standard at our Institute. The study was undertaken to demonstrate the utility of Evaflux Cascade Plasmapheresis (CP) in reducing DSA (anti-HLA antibodies) enabling a successful renal transplantation outcome wrt Creatinine improvement on follow-up, and graft age. To the best of authors' knowledge, this retrospective study is the first explicative work on desensitization using immunosuppressants interspersed with cTPE and/or CP using Evaflux Plasma Fractionator (Kawasumi Laboratories, Inc.). MATERIALS AND METHOD: This retrospective study was conducted from September 2023-January 2025. Archival data was extracted to compile all patients with ESRD having DSA (Anti-HLA antibodies and/or Anti-MICA antibodies) in their plasma and/ or those having high-risk for HLA sensitization (i.e previous history of renal transplant). Details of cases where CP +/- cTPE was used as part of desensitization protocol prior to renal transplant or biopsy confirmed ABMR/CABMR post-renal transplant cases were analysed. RESULTS: A total of 47 cascade plasmapheresis procedures with (n= 6 patients) or without (n=9 patients) cTPE were performed in 15 patients either detected with donor specific antibodies [Anti-HLA antibodies – Class -I (n=1/15); Class-II (n=6/15); Class I & II (n=3/15) and/or Anti-MICA antibodies (n=1/15)] in their plasma and/or a previous history of renal transplant (n=13/15) or identified with biopsy confirmed ABMR/CABMR post-renal transplant (n=2/15) and requiring CP and/or cTPE. Detection and monitoring for anti-HLA DSA (Luminex Conventional Technology/ Single Antigen Bead Assay by Fluoro Analyzer) and immunosuppressants administration (tailored as per case) was subjected to primary team's discretion. For the one patient having Class I, antibodies SAB was not done (neither prior nor after sessions); For patients (n=6/15) with Class II, the mean MFI reduction noted was 3365.6 (63.1%). Amongst the patients with antibodies against both Class I and Class II, two patients were successfully desensitized with mean MFI reduction as 9409.2 (75.2%) whereas in one patient, it was not achieved. In another category, one patient with anti- MICA antibodies, desensitization was achieved; however, the patient succumbed to death due to secondary infections prior to transplant. Overall, for our patients, the mean number of days of follow-up (graft age) was 462.4 days and mean level of S.Creatinine on last follow-up was 1.97 ± 0.79 ± 0 . 79 mg/dl. One case with Class I antibody was diagnosed with biopsy confirmed ABMR and underwent 5 sessions of cTPE and two sessions of CP were done in pre-transplant course. Two patients (biopsy confirmed follow-up case of ABMR and CABMR) showed clinical improvement following CP sessions. CONCLUSION: Cascade plasmapheresis offers benefits of higher specificity and reduced plasma protein loss, directly translating into better patient tolerance and fewer complications. We observed mixed results in patients having higher DSA against class II and/or against both class I and class II. However, larger prospective studies are needed to validate long-term graft outcomes

OP 21

AN IN-HOUSE, INDIGENOUS METHOD USING LOW-CONCENTRATION DITHIOTHREITOL (DTT) TO MITIGATE ANTI-CD38 INTERFERENCE WHILE SAFEGUARDING KELL ANTIGEN: A NOVEL BREAKTHROUGH IN PRE-TRANSFUSION TESTING.

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Background : Daratumumab (DARA), a human monoclonal antibody of the IgG1 type that targets CD38 antigens on human cells, has been approved for the treatment of relapsed and refractory multiple myeloma (MM). Anti-CD38 antibodies present in the plasma of patients on DARA therapy bind to CD38 antigens on the red cell surface during indirect anti-human globulin tests (IATs). This interaction results in pan-agglutination and complicates antibody screening, identification, and cross-matching. The American Association of Blood Banks (AABB) Technical Manual outlines a procedure for treating red blood cells (RBCs) with 0.2 mol/L DTT. While this method is effective in eliminating CD38, it may also compromise other antigens, such as Kell, potentially resulting in a failure to detect critical alloantibodies. This process is also time intensive, involving the washing of red cells and extended incubation periods, which may result in red cell hemolysis and consequently delay the patient in receiving the unit. This study aimed to evaluate the efficacy of low-concentration DTT in reducing CD38 interference via Column Agglutination Technology (CAT) while preserving significant antigens, such as Kell. Methods:- Blood samples from patients undergoing DARA therapy, received for pretransfusion workup, were included in the study. Screening and crossmatching were conducted using three distinct concentrations of DTT (0.01, 0.02, and 0.04 mol/L DTT) via CAT in parallel with the standard IAT (0.2 mol/LDTT). The Bio-Rad ID-Diacell panels I, II, and III were used. Additionally, cells 6 and 9 from the Bio-Rad ID-Diacell 11 cell panel, which contain Kell(K) and Cellano(k) antigens, respectively, were used. To each Bio-Rad Anti-Human Globulin (AHG) card micro-column, 50µL of 0.8% reagent RBCs were added, followed by the addition of 25µL of low concentration DTT (0.01, 0.02, or 0.04 mol/L) directly to the top of the micro-column. We included 25µL of PBS in one microcolumn as a control. The cards were incubated at 37°C for 15 min, after which 25µL of the patient's plasma was introduced and maintained at 37°C for 15 min, followed by centrifugation and analysis of results. Result:- Blood samples from four patients receiving DARA therapy were included in this study. The mean age of the patients was 56.5 ± 5.1 years. The initial screening was pan-positive and the packed red cell units were incompatible. The turn-around time for AABB DTT-pretreated screening was 2hours, whereas for low concentration DTT, took only 45 min. At a concentration of 0.04mol/L DTT, all samples demonstrated a pan-negative reaction with both reagent red cells and donor red cells, resulting in compatible units. Cells 6 and 9, when tested with anti-K and anti-k polyclonal antisera, preserved the antigens at all three low DTT concentrations, ensuring that no alloantibodies were overlooked. No signs of hemolysis were observed on the cards. Conclusion:- This novel method made the pre-transfusion workup of DARA patients easier by effectively removing CD38 from red blood cells while preserving significant antigens, Kell and Cellano. This process was fully executed using CAT without inducing hemolysis. This was achieved within a shorter time frame, thereby enabling patients to receive units more rapidly.

OP 22

A SINGLE CENTRE REVIEW OF AUTOMATED RED CELL EXCHANGE: SAFETY PROFILE AND THERAPEUTIC OUTCOMES

Authors:

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Background: Red blood cell exchange (RCE) is a therapeutic apheresis procedure where patient's abnormal red blood cells are removed and replaced with healthy donor red blood cells. It's most commonly used but yet underutilized procedure for hemoglobinopathies like sickle cell disease (SCD) (acute and chronic episodes) and other conditions such as prerequisite for Hematopoietic Stem cell transplantation, severe cases of erythrocytosis or hereditary hemochromatosis, infections caused by intra-erythrocytic parasites such as malaria or babesiosis. In addition, for cases of methemoglobinemia resulting from drug overdose or poisoning, where hemoglobin is altered and oxygen delivery to tissues is impaired, the role of Red Cell Exchange is still being investigated. Sickle cell disease is an inherited single-gene autosomal recessive disorder characterized by the presence of sickled red blood cells which can cause vaso-occlusion. Patients typically experience repeated painful crises, chest infections, stroke or priapism leading to significant morbidity and organ dysfunction. Standard treatments for SCD such as hydroxyurea and regular blood transfusions are crucial but they come with significant drawbacks like iron overload and alloimmunization (when the body's immune system creates antibodies against donor blood). Red cell exchange (RCE) is a promising treatment for sickle cell disease complications. It reduces blood viscosity thereby enhancing oxygen-carrying capacity and ultimately leading to better clinical outcomes for patients. Our study aimed to assess effectiveness of red cell exchange (RCE) in different clinical conditions and to characterize the clinical profile of the patients receiving this treatment. Methods This retrospective study analyzed medical records of patients who underwent RCE at our institute over a period of 9 years. Procedures were performed by using centrifugal apheresis device Comtech (Fresenius Kabi). Patients were closely monitored for adverse transfusion reactions and procedure-related side effects. Clinical efficacy was evaluated by Hematocrit, Oxygen Saturation and sickle hemoglobin (Hb S) levels after the procedure. Descriptive statistics were used to summarize the data. Results A total of 23 patients underwent red cell exchange during study period. Out of which 3 patients were of accidental poisoning and 20 patients were of sickle cell disease. There was a slight predominance of male patients (52.17 %) with an average age of 21.6 years. RCE was performed with the goal of reducing the percentage of hemoglobin S (HbS) to below 30% and maintaining the hematocrit (HCT) at no more than 30%. The replacement fluids used were 0.9% Normal Saline and fresh (within 5 days of collection), phenotyped, leukoreduced, and irradiated packed red blood cells. Continuous IV infusion of Calcium Gluconate in normal saline was given to prevent citrate toxicity. Clinical efficacy was demonstrated by a significant post-procedure decrease in mean Hb S levels from 70.24% to 24.9% in sickle cell disease patients. Similarly, in poisoning patients, mean methemoglobinemia levels decreased from 35.5% to 17% after the procedure. Conclusion RCE is a safe and cost-effective treatment modality with minimal side effects or complications. It provides immediate relief during acute complications and also plays a crucial role in preventing long-term issues like iron overload and the organ damage.

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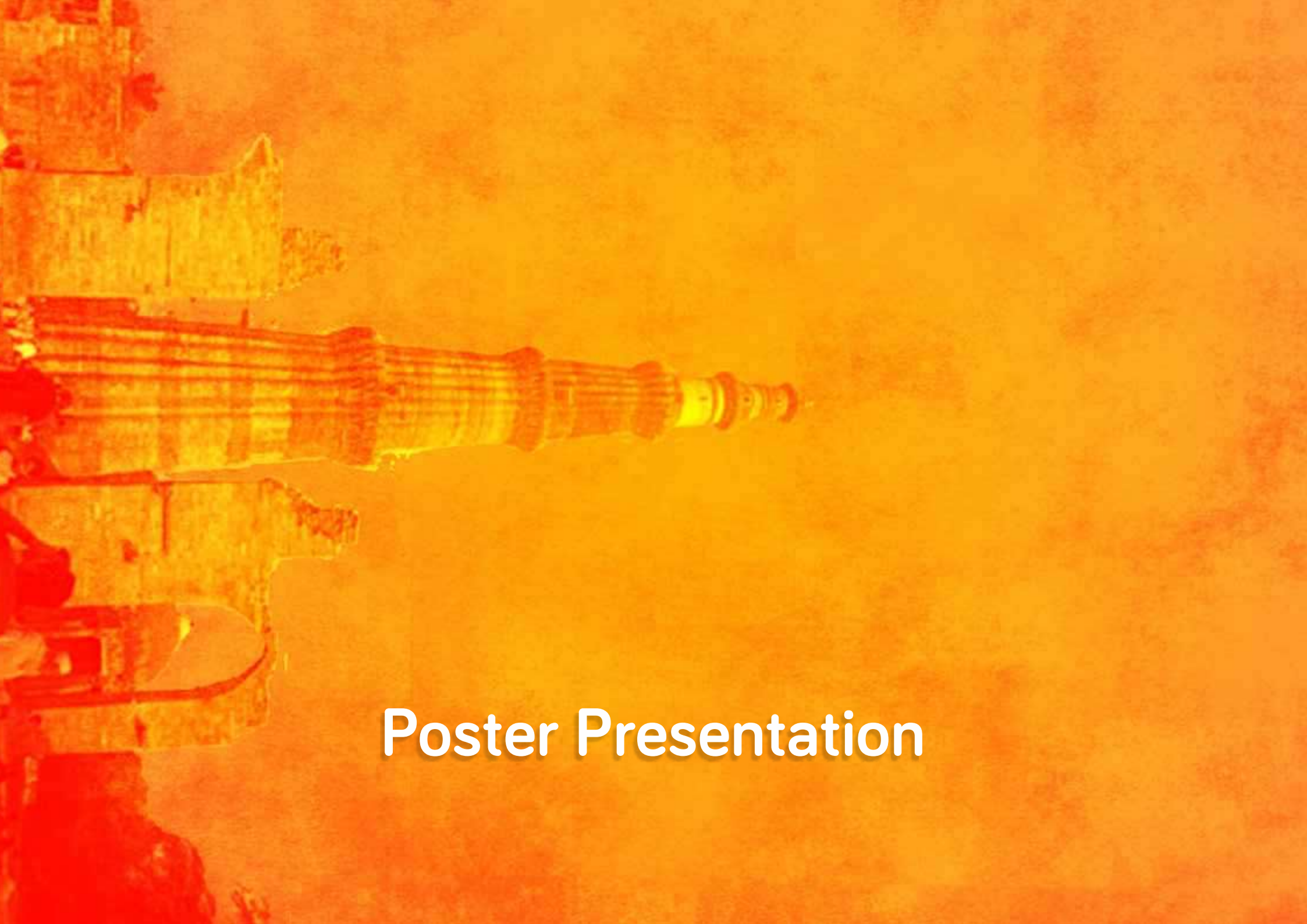

Poster Presentation

PP 1

FREQUENCY OF ABH AG SECRETORS AND NON-SECRETORS IN BLOOD DONORS IN A BLOOD CENTRE OF EASTERN UP USING SALIVA SAMPLES

Authors:

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Background: ABO blood group antigens are not only expressed on red blood cells but also in body fluids such as saliva, tears, semen etc, depending on the secretor status of an individual. The ability to secrete these antigens is governed by the presence of a functional FUT2 gene. Secretor status has significant forensic, epidemiological and clinical relevance, including its association with susceptibility to certain diseases. The frequency of secretors and non-secretors can vary across populations and geographical regions, making regional data essential. Aims: To determine the frequency of secretors and non-secretors in the eastern region of Uttar Pradesh, India, using saliva samples and to analyze the distribution in relation to ABO blood groups. Methods: A cross-sectional study was conducted on 100 healthy blood donors residing in the eastern UP. Unstimulated saliva samples were collected and subjected to the agglutination-inhibition method for the detection of ABH antigens. Individuals were categorized as secretors and non-secretors based on the presence or absence of ABH antigens in their saliva. Results: Among the 100 donors tested, 83% were found to be secretors, while 17% were non-secretors. A higher frequency of secretors was observed among individuals with blood group B. The secretor status distribution showed statistically significant variation with respect to ABO blood groups ($p < 0.05$). Conclusion: The study reveals that the majority of the population in eastern UP are secretors, aligning with global trends. The observed frequency highlights the genetic uniformity and can be of significant utility in forensic identification and disease association studies in this region.

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PP 2

A CASE OF AUTOIMMUNE HEMOLYTIC ANEMIA WITH POSITIVE DIRECT COOMBS TEST IN A PEDIATRIC PATIENT AT RIMS IMPHAL

Authors:

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Background : A 10-year-old female presented with a 10-day history of fever, viral exanthem, and generalized lymphadenopathy. On examination, she had hepatosplenomegaly, pallor, and red-colored urine, suggestive of hemolysis. A Direct Coombs Test (DCT) was ordered on 20.02.25. Laboratory findings revealed: • Hemoglobin: 7.2 g/dL • Hematocrit: 17.8% • Platelet count: 30,000/µL Peripheral smear showed -moderate anisocytosis, microcytic hypochromic cells with polychromasia, macrocytes, and occasional nucleated RBCs. Liver function test showed: •Total bilirubin: 3.4 mg% • Direct bilirubin: 1.5 mg% Urine microscopy revealed- Granular casts. Methodology Initial immunohematological investigations: • DCT (Tube method): Polyspecific = 1+ • Gel card: Monospecific anti-IgG = 2+ • Indirect Antiglobulin Test (IAT): 1+ • Antibody screen: 3-cell panel = Positive • Antibody identification: 14-cell panel = Pan-reactive Outcome • Blood grouping (Tube method): Forward = A+ve; Reverse = A • Thermal amplitude testing with pooled O cells: o4°C: 1+ (1:16) o Room Temp: 1+ (1:2) o 37°C: Negative • Donath-Landsteiner test: Positive (Hemolysis at 4°C x 90 min) • Crossmatch (AHG method): Compatible • Gel card: 1+ reaction Transfusions: •21.02.25: 3 units Platelets, 1 unit PRBC (least incompatible) • 23.02.25: 1 unit PRBC (compatible) Conclusion This case report presents a 10-year-old girl with autoimmune hemolytic anemia (AIHA), confirmed by DAT positivity and pan-reactive autoantibodies, likely triggered by a recent viral illness. Clinical findings included pallor, hemoglobinuria, thrombocytopenia, and hepatosplenomegaly. Transfusion was guided by clinical symptoms rather than strict hemoglobin thresholds, using least incompatible PRBCs. Auto-adsorption was performed to exclude underlying alloantibodies, as there was no recent transfusion history. The case emphasizes the importance of early recognition, detailed immunohematologic workup, and appropriate transfusion support. In pediatric AIHA, careful monitoring and individualized transfusion strategies are essential to ensure safe and effective management while minimizing potential complications.

PP 3

LEVERAGING CMV-NEGATIVE BLOOD DONORS: A DATABASE INITIATIVE FOR TRANSPLANT PATIENT CARE

Authors:

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Background: Cytomegalovirus (CMV) is an important cause of mortality and morbidity in transplant recipients. Transfusion-transmitted CMV (TT-CMV) cannot be prevented by pre-donation screening or post-donation serologic testing. This study aims to determine CMV prevalence, build a database of eligible CMV-negative donors, and assess factors influencing donor willingness and barriers to mobilizing dedicated donors. MATERIALS AND METHODS: This prospective study was conducted on 2,110 whole blood donors from November 2024 to January 2025. The seroprevalence of anti-CMV IgG and IgM antibodies were assessed. A database of CMV-negative donors was created, and these donors were encouraged to enrol in the database which is essential for supporting transplant recipients. OUTCOME: Out of 2,110 donors, the seroprevalence of anti-CMV IgG antibodies was 95.8%, IgG with IgM was 0.28%, while none were seropositive for IgM (0%). Among the donors, 3.93% (n=83) were CMV-negative, of which 34.94% (n=29) agreed to enrol in the database, and only 9.2% (n=7) of replacement donors consented to donate voluntarily for transplant recipients. The most common reason for refusal to donate was lack of time. CONCLUSION: This study aims to determine the prevalence of CMV in the population and identify CMV-negative individuals to build a database of eligible donors willing to provide blood or components for transplant patients. Ensuring a reliable CMV-negative donor pool could significantly improve transplant outcomes in vulnerable patients.

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PP 4

AN ANALYSIS OF IMMUNE-HAEMATOLOGICAL ANOMALIES IN WHOLE BLOOD DONORS AT A TERTIARY CARE ONCOLOGY INSTITUTE OF NORTH INDIA

Authors:

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Background: As per the guidelines of National Standards for Blood centres in India, it is mandatory to perform determination of ABO group, determination of Rh (D) type and tests for detecting unexpected antibodies in the serum of all donor samples. The aim of the study is to analyse the immune-haematological anomalies in whole blood donors at our centre. Methods: 5000 whole blood donor samples were analysed for the presence of immune-haematological anomalies in post donation samples. ABO group and Rh type was determined by testing red cells using column agglutination. In case of Rh-negative typing, weak D testing was done using the IAT method using IgG anti-D and AHG. Detection of unexpected antibodies was done using pooled O cells on column agglutination technology. Results: ABO Blood grouping discrepancies were found in 2 donor samples. The cause was ascertained to be weak A sub- groups. The discrepancies were resolved by using lectins and secretor studies. One Rh negative samples were identified as weak D and subsequently marked as Rh positive. Unexpected antibodies were detected in 3 blood donor samples. On further identification, they were found to be Anti – D in 2 cases and anti-M in one case. Four donor units were DAT positive which were detected during workup for incompatible cross match. One of the donors was found to be suffering from an autoimmune disease while other 3 were healthy with no history of disease. Conclusion: Thorough immune-haematological workup is essential to rule out anomalies in post donation samples of apparently healthy blood donors. Further workup should be done and only suitable components should be issued to mitigate chances of adverse reactions in the recipient. DAT positive donors may be followed up for clinical evidence of hemolysis and development of autoimmune diseases or malignancies in long run.

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PP 5

THE HIDDEN CULPRITS IN IMMUNOHEMATOLOGY: A CASE REPORT AND REVIEW OF LITERATURE OF SEROLOGICAL INTERFERENCES FROM REAGENT-DEPENDENT ANTIBODIES.

Authors:

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Background: Pretransfusion testing is paramount in transfusion services as it identifies clinically significant antibodies. However, during routine tests, we may occasionally encounter a few non-specific or nuisance antibodies. These antibodies are not directed against known blood group antigens and typically are of no clinical significance. Despite being harmless, their unpredictable reactivity can lead to additional unnecessary immunohematological investigations. Case report: We received the blood sample of a 29-year-old male with polytrauma posted for surgery for pre-transfusion testing. The sample was typed as "O" positive without any discrepancy in blood grouping by automated column agglutination technique. His hemoglobin was 8.8g/dl, so two packed red cell (PRBC) units were requested for surgery. Compatibility testing was done with two units of "O" positive PRBC bags, and it was found that they were incompatible. Further immunohematological workup was initiated. Autocontrol and Indirect antiglobulin test (IAT) were positive (2+ reaction). In contrast, the Direct antiglobulin test (DAT) was negative, and antibody screening with a three-cell panel showed panreaction. There was a history of previous blood transfusions 2 weeks ago. The sample was sent to a higher referral laboratory for further testing. Antibody identification using an 11-cell panel also showed a pan reaction. This was observed only with reagent red cells, so a repeat antibody screening test was performed using saline-washed cells. All the tests repeated using saline were negative. From the above result, an antibody against a low-ionic-strength solution (LISS) was suspected and reported by the Referral Laboratory. Further cross-matching of blood units done using the saline solution was compatible. The patient was transfused uneventfully. Conclusion: A pre-transfusion test is crucial to ensure a safe blood transfusion. Any observed incompatibility must be resolved before transfusion. In rare instances, antibodies directed against enhancement media may be the underlying cause of crossmatch incompatibility.

PP 6

TRENDS OF SYPHILIS AMONGST VOLUNTARY BLOOD DONORS-AN ANALYSIS

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Background: Syphilis is a chronic infectious disease caused by Treponema pallidum and is one of the transfusion-transmissible infections (TTIs) screened during routine blood donation. Although voluntary blood donors are generally considered low-risk, detection of syphilis among this group can reflect broader trends in the community and help in assessing blood safety. To study the prevalence and trend of syphilis among voluntary blood donors over a defined period, and to observe any significant demographic patterns. Materials and Methods: This retrospective study was conducted at the Indian Red Cross Society, Ahmedabad District Branch over a period of 10 years from January 2015 to December 2024. All voluntary blood donors were screened for syphilis using 3rd generation Enzyme-Linked Immunosorbent Assay (ELISA) method. Reactive samples were confirmed using ELISA and Chemiluminescence method. Data was compiled and analyzed yearly to assess trends. Results: Total of 490,244 voluntary blood donors were screened during the study period. Out of these, 2782 samples (0.57%) tested reactive for syphilis. The highest annual prevalence was noted in 2020 & 2021 (0.67%) and the lowest in 2018 (0.50%). The overall trend shows significant rise after covid-19. After Covid-19 the trend did not show a consistent rise or fall but fluctuated slightly over the years. Conclusion: The prevalence of syphilis among voluntary blood donors was not negligible. The data suggest the need for strict donor screening protocols and continued public health education regarding sexually transmitted infections. Monitoring trends in the donor population can also provide indirect insight into community transmission patterns.

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PP 7

A COMPARATIVE STUDY BETWEEN TWO DIAGNOSTIC MODALITIES FOR QUANTIFYING FETOMATERNAL HEMRRHAGE: AN INDIAN TERTIARY CARE CENTRE EXPERIENCE

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Background: Significant Fetomaternal hemorrhage(FMH) is a phenomenon known to complicate pregnancies and require early and accurate detection to effectively manage such occurrences for which very few quantitative tests are available. The Kleihauer Betke (KB) test and the Flowcytometry (FCM), are well established test in western countries however, the same have not been standardized in Indian population, thus necessitating this study. The KB test and FCM were assessed in terms of detection and quantification of FMH to investigate the concordance and comparative performance between them. Aims & Objective: Aim of this study was to evaluate and compare the quantification of FMH by KB test and FCM. Material & Methods: 50 antenatal participants were included in the study after a written informed consent. Venous blood sample (2X3ml, 01 maternal and 01 Cord blood) were collected in EDTA tube within 24hrs of delivery. Blood samples were stored at 2-6°. Baseline tests like ABO Rh grouping of mother and baby, maternal Hemoglobin, Indirect Antiglobulin Test/Direct Antiglobulin Test were done and documented. Fetomaternal hemmorhage was quantified with KB test and FCM and the results were documented and statistically analysed. Results: There was a good correlation between the two methods in terms of detection of significant FMH. The KB test showed a favourable ability to identify significant FMH. Conversely, a negative KB test result reliably excludes significant FMH, offering robust reassurance. In concurrence of our statistical results KB test emerged as a valuable and cost-effective tool in FMH detection, particularly in cases of significant FMH. Conclusion: Flow cytometry despite being highly sensitive, and a gold standard test, in quantification of FMH, comes with its own sets of challenges for resource poor setups. Use of KB test is a reliable, accessible, readily available and practical alternative to FCM especially in Rh negative pregnancies.

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PP 8

CD34+ CELL DOSE - PREDICTORS AND EFFECT ON PATIENT OUTCOME IN HEMATOPOIETIC STEM CELL TRANSPLANT

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Background: CD34+cells quantify the dose of HSC (hematopoietic stem cell) for transplant. We evaluated predictors of adequate HSC dose and its effect on patient outcomes. Objectives: To correlate donor haematological parameters, their increments and pre CD34+ cells with product CD34+ cell yield and establish its minimum thresholds. To analyse CD34+ cell dose effect on outcomes. Methods:Retrospective analysis (2016–2022) was conducted on all HSCTs. Regression analysis evaluated pre-procedure MNC, TLC, their increments and, pre CD34+ cell count with CD34+cell product yield and ROC derived minimum threshold of significant predictors for adequate yield. Outcomes (engraftment, overall survival (OS), relapse, GvHD, PGF and NRM) were analysed across three dose categories, <5X106/kg, 5-7 X106/kg and >7X106/kg. Competing risk survival analysis was done and expressed as (HR, 95%CI, p<0.05). Results:Total 78 HSCT procedures (allogenic: autologous=50:28) in 63 patients were analysed. TLC (r= 0.01, p=0.89) and MNC (r=0.37, p=0.92) weakly correlated with CD34+cell yield while, TLC increment was moderately correlated approaching significance(r=0.58, p=0.07). PB CD34+cells/µL strongly correlated with product CD34+cell/µL (r=0.71, p=0.006) with 27.25 CD34+ cells/µL (AUC= 85.7%) predicting >4 × 10^6 cell/kg yield (92.9% sensitivity, 75% specificity). Six-year OS was 61.91%. The cumulative incidence of engraftment, relapse (RI), PGF, NRM and GvHD was 85.7%, 22.4%, 16.4%, 9.7% and 18.6% respectively. Dose category III (HR: 3.82, 95%CI: 1.0-13.5, p=0.03) had poor OS with no other dose associations with outcomes. Age (HR: 1.03, 95%CI: 1.003-1.06, p=0.02) male gender (HR: 4.01, 95%CI: 1.16-13.9, p=0.02) and female to male HSCT (HR: 0.03, 95% CI: 0.001–0.5, p = 0.01) were associated with poor outcomes. Conclusion: Threshold of 27.25 CD34+ cells/ µL to predict >4 × 10 cell /kg yield was established. TLC increment correlates with CD34+ yield, offering insights for further research in resource-limited centres. Higher CD34+cell dose negatively affected OS. Gender, age, engraftment and gender heterogeneity affected outcomes.

PP 9

THERAPEUTIC PLASMA EXCHANGE (PLEX) IN ACUTE LIVER FAILURE

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Background: Therapeutic Plasma Exchange (PLEX)used to treat neurological renal hematological diseases since long. Recently increasing evidence of its use treating patients with acute liver failure (ALF) syndromes. Aim: To further establish treatment with PLEX in case of acute liver failure due to Hepatitis A toxicity to stabilize patient (1) and to do away with need for liver transplantation. Materials & Methods: PLEX (1.3 Plasma volume each and 80% replacement) done on patient 21year old male presenting fever nausea vomiting yellow discoloration of eyes skin decreased urine output dehydration generalized weakness diagnosed as acute liver failure due to Hepatitis A viral infection. PLEX performed every alternate day total 4 sessions i.e. on 15,17,19 ,21st november 2024 along with SLED for acute renal failure as per patient requirement. Medical treatment in form of iv albumin N acetylcysteine infusion hypertonic saline infusion iv antibiotics PPI antiemtics and other supportive management, Inotropic support tapered off in view of improving general condition successful weaning trial patient extubated after 3 days after first PLEX and one SLED put on oxygen support at 7litres per minute. Need to perform PLEX reviewed each day based on clinical progress and tolerance to the procedure. Results: The gradually reducing total bilirubin of patient between 15th to 22 november 2024 with plasma exchange being done on 15,17,19 and 21 november 2024, also reviewed and discussed serum direct and indirect bilirubin levels between 15 to 22nd November 2024.Gradually improvement in symptoms and signs related to illness and patient went back walking from hospital. Conclusions : Clearly proves survival benefit with PLEX over standard medical treatment cases of ALF ,especially early acute stages of ALF right opportunity to treat, aimed retarding progression of liver failure helping recovery of liver functions with no extra hepatic organ dysfunction optimal candidates .alternate to liver transplant .

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PP 10

HIGH HEMOGLOBIN IN BLOOD DONORS : DIFFERENTIATING BENIGN CAUSES FROM POLYCYTHEMIA VERA : A REVIEW STUDY

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Background: Elevated hemoglobin concentrations in blood donors are common incidental findings during donor screening processes. We have lower limit for hemoglobin defined as <12.5% but what about upper limit? While most cases are attributable to benign or secondary causes—such as smoking, chronic hypoxia, androgen therapy, or dehydration—a subset may represent undiagnosed polycythemia vera (PV), a myeloproliferative neoplasm with potential thrombotic complications if left untreated. Distinguishing secondary erythrocytosis from PV is clinically critical yet often underappreciated in transfusion settings. Objective: This review aims to systematically analyze the causes of elevated hemoglobin in blood donors, with a focus on differentiating benign/secondary causes from PV using established

Diagnostic pathways and molecular markers. Methods:
A systematic search of PubMed, Scopus, and Web of Science databases identified 20 relevant studies published between 2000 and 2024. Key diagnostic tools evaluated across the literature included erythropoietin (EPO) levels, JAK2 V617F mutation testing, bone marrow biopsy, red cell mass studies, oxygen dissociation curves, and clinical history assessment. Results: Across the studies reviewed, 68–90% of donors with elevated hemoglobin had secondary causes identified, such as smoking, high-altitude residence, or androgen use. However, in 5–12% of cases, especially in males with hemoglobin >18.5 g/dL or hematocrit >52%, further evaluation revealed underlying PV. Low serum EPO levels were reported in 70–95% of PV cases, and the JAK2 V617F mutation was present in approximately 95% of confirmed PV diagnoses. Bone marrow biopsy and red cell mass measurement were less frequently performed in donor settings due to limited access but were emphasized as gold standard diagnostic tools in hematologic clinics. Conclusion: Elevated hemoglobin in blood donors is often benign but warrants further workup in persistent or unexplained cases. Integration of molecular testing—particularly JAK2 mutation analysis—and EPO measurement into donor evaluation algorithms may facilitate early diagnosis of PV. Increased awareness and standardized referral protocols can enhance patient safety by identifying high-risk individuals at an earlier, often asymptomatic stage.

PP 11

COMPARATIVE STUDY OF SEROPREVALENCE OF HEPATITIS B AND HEPATITIS C IN HEALTHY BLOOD DONORS

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Background: Hepatitis B and Hepatitis C are significant health problems that might progress to morbid sequelae of liver cirrhosis and hepatocellular carcinoma. A higher prevalence of HBV and HCV in blood donors pose an increased risk of window period transmission through blood transfusion. The present study aims to know the seroprevalence of HBV and HCV among blood donors. Methods: This is a retrospective study conducted at Blood Centre of Motilal Nehru Medical College, Prayagraj. Total donations from 1 May 2024 till 30 April 2025 were recorded from donor record register. Serum samples were tested for anti HBs antibody and anti HCV antibody using Sandwich and Indirect ELISA respectively. Serum Samples were also sent for ID NAT (Individual Donor Nucleic Acid Testing). Seropositive results were recorded separately in donor records. Results: The seroprevalence of HBV was 0.74% (Male-0.49%, Female-0.33%) and HCV was 0.13% (Male-0.13%, Female-No seropositive donors). Maximum numbers of HBV positive donors belonged to blood group B+ (12) followed by O+ (10), A+ (6), AB+ and AB- (2 each), A- and O- (1 each). Maximum numbers HCV positive cases belonged to blood group A+, B+, O+ (2 each) followed by A- (1). Seroprevalence of HBV among Replacement donors was 0.44% and among Voluntary donors was 0.83%. Seroprevalence of HCV among replacement donors was 0.12% and among voluntary donors was 0.21%. Maximum Hepatitis B+ donors belonged to age group 31-40 years (11) followed by 21-30 years (5). Maximum Hepatitis C+ donors belonged to age group 21-30 years (3) followed by 31-40 years and <= 20 years (2 each). Conclusion: Due to stringent screening facilities, vaccination and treatment protocols, Hepatitis B and Hepatitis C are now Submerging transfusion transmitted infections in India. Though the cases in the window period escape detection still the risk of transmission has reduced considerably due to rigorous efforts of Blood Transfusion services and public awareness.

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PP 12

A CROSS-SECTIONAL STUDY OF PREVALENCE OF HIGH TITRE ANTI-A AND ANTI-B ANTIBODIES IN O BLOOD GROUP DONORS IN LOCAL CHHATTISGARH POPULATION

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Background: Transfusion of group O blood to non-O recipients carries risks due to anti-A and anti-B isoagglutinins, potentially causing hemolytic reactions. This study evaluated the prevalence of high-titre & variation of titres of antibodies in group O donors to aid in safer transfusion practices in Blood Bank AIIMS Raipur. Methododology: A cross-sectional study was conducted at AIIMS Raipur over 18 months (2023–2025) including 364 eligible group O donors were randomly selected and tested. Anti-A and anti-B titres (IgM and IgG) were measured using the conventional tube agglutination method. High titre was defined as ≥1:64 for IgM and ≥1:256 for IgG. Outcome: Among donors (mean age 31.1 ± 7.9 years; 98.6% male), high anti-A IgM titres were observed in 53.0%, anti-B IgM in 29.1%, anti-A IgG in 16.8%, and anti-B IgG in 7.7%. Younger donors (18–35 years) and mixed diet individuals had a higher prevalence of high titres. Conclusions: A substantial proportion of group O donors had high-titre anti-A and anti-B antibodies, particularly IgM. Routine screening for isoagglutinin titres is recommended to minimize transfusion-related risks, especially for pediatric and out-of-group transfusions.

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PP 13

EFFECT OF INTERRUPTED AGITATION ON QUALITY OF RANDOM DONOR PLATELETS

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Background: During the shipping and transportation of platelet concentrates (PCs) from blood centre to hospitals or to the war-affected areas in military settings, PCs experience minimal agitation for several hours up to 1–2 days. However, during stationary periods, platelets may suffer from inefficient oxygen transfer. Aim was to explore whether interruption of agitation enhances quality and viability or has a detrimental impact on PCs with an objective to examine the impact of allowing 4-day interruption of agitation compared to continuous agitation on PCs stored for 5 days. Methodology: PCs were prepared using the Platelet Rich Plasma method and stored for 5 days at 20-24°C in platelet incubator cum agitator. 20 PCs randomly divided into two groups, continuous agitation (CA) group - under continuous agitation for 5 days and interrupted agitation (IA) group - without agitation for 4 days. Activation markers (CD62P and Annexin V) and blood gas parameters were analyzed on days 1, 3 and 5 of storage. Outcome: Despite an extended period without agitation, pH remained stable (>6.7) in IA group. CD62P and Annexin V expression on Day 5 was higher in the CA group, with a statistically significant difference. Interruption of agitation resulted in increased lactate concentration, proportionate to the duration of interruption and platelet count. Conclusion: Our study's findings suggest that platelets can endure longer periods without agitation than previously documented. These findings imply that CA better preserves the metabolic environment of PCs, while IA may reduce premature platelet activation. However, it is crucial to recognize that favorable in vitro parameters do not necessarily translate to effective in vivo outcomes.

PP 14

A COMPARATIVE PROSPECTIVE STUDY ON THROMBOELASTOGRAPHY (TEG) PARAMETERS WITH CONVENTIONAL COAGULATION TESTS (CCTS) DURING LIVER TRANSPLANT SURGERIES – A SINGLE CENTER STUDY

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Background: Thromboelastography (TEG) is a point-of-care global coagulation assay that evaluates blood clotting through viscoelastic changes using whole blood. TEG operates by monitoring torque resistance as blood clots around an oscillating pin, generating electrical signals for analysis. Conventional Coagulation Tests (CCTs) have significant limitations such as sample collection issues, poor prediction of bleeding risk, inability to detect hypercoagulable states, and time delays in results. Unlike CCTs, which assess distinct clotting pathways, TEG provides rapid, bedside, real-time, comprehensive coagulation assessment. TEG has proven valuable in cardiac surgery, trauma, hypercoagulable states, and hyperfibrinolysis detection. In liver transplant surgeries, complex coagulopathic shifts occur across surgical phases due to rebalanced hemostasis in End Stage Liver Disease (ESLD). Through this study, we aim to compare Thromboelastography with Conventional Coagulation Tests in terms of parameters and transfusion management during liver transplant surgeries. Method: This prospective comparative study, conducted at a North Indian tertiary care centre, comprised 60 adult liver transplant patients between April 2023 and September 2024. Patients aged 18 years and above undergoing liver transplants were included, while pediatric cases, repeat transplants, perioperative deaths, multi-organ transplants, and non-consenting participants were excluded. Data collected encompassed patient demographics, CTP (Child-Turcotte-Pugh) and MELD (Model for End-Stage Liver Disease) scores, liver function parameters, components transfused perioperatively, along with thromboelastography parameters (R-time, K-time, alpha angle, maximum amplitude, LY30) and conventional coagulation tests (prothrombin time, activated partial thromboplastin time, international normalised ratio, platelet count, fibrinogen, D-dimer). Data analysis was done using Microsoft Excel and SPSS version 29, employing Pearson correlation for the TEG-CCT relationship and Wilcoxon signed-rank testing for comparing transfusion requirements. Results: Of the 60 patients, 46(76.7%) were males, and the mean age of the patients was 49.63±10.9 years. Most patients had CTP score B (50%) or C (43.3%) and MELD score of 11-20 (63.3%). Primary etiologies were ethanol-related DCLD (23.3%) and cryptogenic DCLD (15%). A total of 187 TEG tracings were performed. Mean TEG parameters were R-time 10.5±8.6 minutes, K-time 4.9±5.9 minutes, alpha angle 45.9±15.3°, MA 47.8±12.2 mm, LY30 0.2±1.1%. Mean CCT parameters were platelet count 74.6±48.6×10^3/µL, PT 26.2±16.8 minutes, APTT 63.3±27.9 minutes, INR 2.1±0.8, fibrinogen 204.3±90.1 mg/dL and D-Dimer 2172.5 ± 1768.9 ng/ml. Significant correlations were found between alpha angle and fibrinogen (r=0.797), MA and fibrinogen (r=0.640), MA and platelets (r=0.516), and LY30 and D-dimer (r=0.769), with p<0.001. TEG-guided transfusion requirements significantly exceeded CCT-predicted requirements for platelets (3 vs 0 units, p<0.001) and FFP (8 vs 4 units, p<0.001). Conclusion: This study showed that TEG parameters correlated well with traditional coagulation tests, suggesting that a single point-of-care TEG could replace multiple cumbersome assays. Unlike traditional tests that only evaluate clot initiation, TEG comprehensively assesses all phases of cell-based coagulation—initiation, amplification, and propagation. Liver transplant patients experience rebalanced hemostasis with fluctuating coagulation profiles during surgery, making accurate assessment essential for optimal graft outcomes. TEG offered functional coagulation evaluation and helped guide appropriate blood component transfusions in our study. We strongly recommend adopting TEG-based transfusion protocols in liver transplant surgeries for better patient blood management and improved surgical results.

PP 15

BETA THALASSEMIA MAJOR: MANAGING IRON OVERLOAD WITH CHELATION THERAPY

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Background: β Thalassemia is a hereditary blood disorder with defect in beta globin chain production. Reduced β globin chain production , causes unopposed free α globin chain production. These aggregates causes damage to red cells and erythroblasts in bone marrow causing anemia and ineffective erythropoiesis.
Iron absorption increases from intestine due to ineffective erythropoiesis. Chronic regular blood transfusion therapy markedly increases iron accumulation, leading to iron overload, which may damage parenchymal cells of liver , pancreas , heart . This leads to growth retardation, endocrine and organ dysfunction .These patients are on life long blood transfusion therapy hence chelation therapy is also required life long. AIMS: The study was aimed to assess the effectiveness of iron chelation therapy in pediatric thalassemic cases at tertiary care hospital in Northern India. METHODS Thalassemia patients were observed for last one year , from June 2024 to June 2025. Out of 25 patients , 17 were regular patients out of 17 ,12 were on regular oral chelation therapy. Success of iron overload management was observed by monitoring serum ferritin levels . Atleast 2 levels of S. ferritin were observed 6-8 months apart, in same patient. Decreased /constant serum ferritin levels was the criteria for success of chelation therapy. Normally Tab Deferasirox 500 mg OD dose was started (as defarasirox has half life of 8-16 hours), which was changed on response to serum ferritin level.If required Tab Deferiprine 500 mg TDS was added ,as it has narrow therapeutic window and side effects of arthropathy and agranulocytosis, it was second choice of oral treatment. RESULTS S. ferritin levels decreased significantly in 7 thalassemic patients, who were on oral chelation therapy of tab defarasirox +/- tab Deferiprone , over atleast a period of one year. 3 thalassemic patients showed constant S . ferritin levels. 1 patient showed increased levels of S. ferritin levels, after adjusting dose of oral chelation therapy s. ferrritin levels were observed again in these patients. CONCLUSION Tab Defarasirox is an effective oral iron chelator when started at an optimum time and with optimum dose. Its effect is enhanced with support of other chelating agent Tab deferiprone. Atleast one year of therapy is needed for significant lowering of S. ferritin levels in paediatric thalassemic patients on multiple blood transfusions.

PP 16

A QUALITATIVE STUDY INTO BLOOD DONATION CAMP ORGANIZERS' PERCEPTION ON THE FACILITATORS AND BARRIERS OF ORGANIZING A BLOOD DONATION DRIVE AND MEASURES ADOPTED THEREOF BY THE BLOOD CENTRE

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Background: Blood Donation Camp is a crucial component in promoting voluntary blood donation. Camp organizers play a vital and pro-active role in the conduction of these drives. Understanding the process of organizing a camp and challenges faced by camp organizers can improve the quality of the drive and blood safety. This is a first of its kind qualitative research intended to understand the facilitators and barriers of conducting VBD from the perspective of camp organizers and to implement appropriate improvements in the organizing process at our Blood Centre. Objectives: 1. To conduct a qualitative study exploring organizers' perception on the facilitators and barriers of conducting a blood donation drive. 2. To gather the organizers' opinion on the scope of improvement at our Blood Centre. 3. To take appropriate remedial measures from our Blood Centre to address the barriers identified. Materials and Methods: Phase I (Qualitative Research): We adopted a qualitative approach involving in-depth interviews (both in-person and telephonic) with voluntary blood donation (VBD) camp organizers over a six-month period. Participants were initially selected through purposive sampling, followed by snowball sampling. A semi-structured interview guide was designed to gather insights on camp planning, the organizers' experiences, strategies to enhance female donor participation, and challenges encountered during camp execution. Written consent was obtained for in-person interviews and verbal consent for telephonic ones. All interviews were audio-recorded, anonymized, and transcribed. Initial codes were derived from the first three interviews and used to inductively develop a framework matrix. Subsequent analysis followed a structured, deductive approach based on Braun and Clarke's medium Q thematic analysis. Facilitators and barriers were identified, guiding corrective measures initiated by our Blood Centre. Phase II: Remedial measures to barriers emerged from phase I were adopted at the blood centre level Results: We conducted 15 in-depth interviews with VBD camp organizers. Among the participants, 66% were male and 33% were female. Key facilitators identified: 1. The presence of a proactive and capable organizational structure with committed members and volunteers. 2. Consistent pre-camp communication with the Blood Centre and adherence to its recommendations. 3. Supportive administrative bodies that facilitate the process by promptly granting necessary permissions. 4. Well-equipped blood centres staffed with trained and experienced personnel. Major barriers identified: 1. Limited public awareness on blood donation process. 2.Private NGOs facing lower prioritization compared to government institutions when scheduling camps. 3. Institutional inertia from Blood Centres. Remedial measures adopted: 1. Distributing Information, Education, and Communication (IEC) materials to organizers and donors to enhance awareness. 2. Created Calendar specific to our Blood Centre for better planning and coordination 3. Conducting pre-camp sensitization and awareness sessions, with site inspection 4. Developed comprehensive checklist, instructional documents, and model layout plan for camp donation sites to simplify the organization process. Conclusion: The facilitators identified in this study can serve as best practices for other camp organizers, streamlining the process of organizing blood donation camps. Addressing the existing barriers through targeted remedial measures is essential to promote voluntary donations, bridge the gap between blood demand and supply.

PP 17

THERAPEUTIC PLASMA EXCHANGE IN LONGITUDINALLY EXTENSIVE TRANSVERSE MYELITIS WITH DISTINCT SEROLOGICAL PROFILES

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Background: Longitudinally Extensive Transverse Myelitis (LETM) is a rare, debilitating inflammatory spinal cord disorder extending over three or more vertebral segments. While commonly associated with Myelin Oligodendrocyte Glycoprotein Antibody Disease (MOGAD) and Neuromyelitis Optica Spectrum Disorder (NMOSD), a subset of patients remain seronegative. Aim: The aim of this study is to evaluate the therapeutic effectiveness of Therapeutic Plasma Exchange (TPE) in two LETM cases—one MOG-IgG positive and one seronegative—unresponsive to corticosteroids. Methods: Two LETM patients underwent diagnostic work-up including MRI spine, cerebrospinal fluid analysis, and serum testing for AQP4 (Aquaporin-4) and MOG (Myelin Oligodendrocyte Glycoprotein) antibodies. Both were initially treated with intravenous methylprednisolone followed by TPE using the Spectra Optia centrifugal apheresis system. TPE sessions were performed on alternate days using 5% albumin as the replacement fluid. Clinical improvement was assessed using neurological examination and motor power grading before and after TPE. Results: In both the cases, TPE was initiated within 7 days of onset of symptoms. An average of 6401 ml of volume is processed per session of Therapeutic Plasma Exchange. Both the patients demonstrated significant neurological improvement following TPE. Motor recovery was evident within the second to third therapeutic plasma exchange sessions, with improvement in lower limb strength, ambulation and bladder function. The procedures were well tolerated, and no adverse events were recorded. Both patients were ambulatory with minimal support and functional gains were sustained on follow up. Conclusions: TPE is an effective and safe adjunctive therapy in LETM cases refractory to corticosteroids, irrespective of antibody status. Early initiation of TPE led to significant neurological recovery in both MOG-positive and seronegative patients. These findings highlight the potential of TPE as a valuable component of treatment strategies for demyelinating myelitis, warranting further investigation in larger clinical studies.

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PP 18

THE TALE OF TWILIGHT TRANSFUSIONS

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Background: Blood transfusion is a multifaceted process influenced by numerous human factors at every stage, from collection and processing to the final administration of the product, making it susceptible to errors. In healthcare facilities, a substantial amount of blood transfusions is done in the night time and it is presumed these transfusions can lead to increased incidence of adverse reactions in patients as late shifts often operate with reduced staffing, decreased clinical vigilance and slower response times. However, the literature to substantiate this concern is limited. Hence, a study was planned to analyse the pattern of blood components issued in our centre and to evaluate the difference in the rate of transfusion reactions in day versus night hours. Methods: This was a retrospective study conducted by the Department of Transfusion Medicine at a tertiary care hospital. Data required for the study was retrieved from Blood management software. The study was conducted over a period of one year, from June 2024 to May 2025. Data collected for the study included the number of components issued, type of components requested, time of issue, admitting area. The data for transfusion reactions was obtained from Transfusion Reaction Reporting Forms. Data was classified according to time of issue: day request (8 am to 8 pm) and night requests (8 pm to am), area of request generation (ward or emergency or ICU). Blood units not returned from the bedside were assumed transfused, in line with institutional policy assigning discard responsibility solely to the blood centre. Results: Of 1,00,522 components issued, 2855 units were received back, total components transfused were 97307. Of these 45.81% were Platelets (RDP and SDP), 45.34% PRBC and 8.84% FFP. 56.13% units were transfused to patients admitted in wards, 37.3% in emergency areas and 6.57% to ICU. 62.54% components were transfused during day and 37.45% during night hours. A total of 35 transfusion reactions were reported. Reaction rates were 2.02, 2.32 and 4.99 per 10,000 Platelets, FFP and PRBC transfused respectively. Reaction rate were 1.97 reactions/10,000 units for day and 6.31 reactions/10,000 units in night hours. The difference was statistically significant (P = 0.0004). 2 reactions from ICU, 8 from emergency and 25 from wards. Conclusion: The analysis highlights distinct patterns between day and night transfusions. Although transfusion reactions were more frequently reported at night, none were attributed to human error. The difference between reaction rates between the two shifts was statistically significant. This may be partly attributed to potential underreporting during the day, as mild reactions could be managed due to availability of more manpower or may go unnoticed due to increased clinical workload.This challenges the perception that night-time transfusions are riskier due to human factors. Most reactions occurred in wards where patients were clinically stable, suggesting that transfusion decisions were often driven by lab reports received in the evening rather than clinical need. These findings underscore the importance of shift-specific interventions, clinically guided transfusion practices, and structured workflows to enhance transfusion safety.

PP 19

HIGH PREVALENCE OF TRANSFUSION TRANSMITTABLE DISEASE IN A SPECIFIC AREA OF BILASPUR, CHHATTISGARH.

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Background: High prevelance of Transfusion transmitted diseases found in Blood donors in a particular locality of Chattisgarh, Bilaspur. Aim We are working at a Blood centre in a tertiary care hospital, in a small city of Chattisgarh. We frequently encounter donors who are illiterate and belong to low socio-economic strata. Recently we have encountered more number of transfusion transmitted cases from Hemu nagar and Shankar nagar, a low socio economic strata mostly occupied by manual sewage workers . Background A high prevalence of transfusion transmitted diseases (TTDs) in a specific area can be a serious public health concern, often linked to factors like poverty , limited access to healthcare, risky sexual behaviors, and lack of awareness. Addressing this requires a multifaceted approach involving education, increased access to testing and treatment, and interventions targeting high-risk populations. Methodology Elisa is the process of choice in our centre, with HIV being IVrth Generation and Hbsag, HCV,third generation Elisa, VDRL and Malaria being rapid method. J.Mitra is the company providing Elisa kits. Outcome: Out of a total of 517 total cases of TTD, 10 cases were found belonging to Hemu nagar and Shankar nagar, giving it a positivity rate of 1.5% Conclusion: Factors Contributing to High TTD Prevalence in a specific area: • Poverty and Socioeconomic Disparities: Areas with high poverty rates often experience limited access to healthcare,leading to higher infection rates and delayed diagnosis. • Limited Access to Healthcare: Lack of readily available and affordable healthcare services, including STD clinics and testing centers, can hinder early detection and treatment. • Risky Sexual Behaviors: Engaging in unprotected sex, having multiple sexual partners, and substance use can increase the risk of STD transmission. • Social and Cultural Norms: Certain cultural or social norms may discourage open discussions about sexual health or discourage condom use. Addressing the Issue: • Education and Awareness Programs: Targeted educational campaigns can increase awareness about TTDs, their transmission, and prevention methods. • Increased Access to Testing and Treatment: Expanding access to free or affordable TTD testing , HBV vaccination and treatment services is crucial. • Promoting Condom Use • Addressing Social and Economic Disparities: Addressing poverty and socioeconomic inequalities can improve access to healthcare and reduce risky behaviors. • Targeted Interventions: Programs that focus on high-risk populations, such as adolescents, commercial sex workers, and individuals with multiple partners, can be particularly effective. • Community Engagement: Engaging local communities and leaders in STD prevention efforts can help build trust and ensure that interventions are culturally appropriate.

PP 20

HIDDEN IN PLAIN SIGHT: DETECTING RARE NATURALLY OCCURRING ANTI-K ANTIBODY IN A BLOOD DONOR

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Background: In The purpose of this study was to identify and characterize a rare, naturally occurring anti-K (Kell) antibody detected in a healthy whole blood donor. While anti-K antibodies are commonly associated with prior transfusion or pregnancy, their spontaneous presence in individuals without such history is exceptionally uncommon and clinically significant due to potential risks in transfusion and obstetric care. Method: A 38-year-old male donor underwent routine pre-donation screening, which included ABO and Rh typing, antibody screening using the indirect antiglobulin test (IAT), Kell phenotyping, and infectious marker testing. Initial findings showed blood group discrepancies and a positive IAT. Further testing included three-cell and eleven-cell antibody panels (Resolve Panel A and B), direct antiglobulin test (DAT), autocontrol, and Coombs crossmatching with Kell antigen-positive and -negative red blood cells. Results: The antibody screening tests confirmed the presence of anti-K antibodies. These antibodies reacted at room temperature and 37°C but not at 4°C, indicating thermal amplitude suggestive of clinically significant IgG. The DAT and autocontrol were negative, suggesting an alloantibody rather than an autoantibody. Crossmatching revealed incompatibility with K-positive red cells and compatibility with K-negative ones. The donor had no prior history of transfusion, surgery, or infection, supporting the conclusion that the anti-K was naturally occurring. Conclusion: This case highlights the rare but critical occurrence of naturally occurring anti-K antibodies in blood donors. The findings emphasize the importance of routine antibody screening even in healthy donors to prevent hemolytic transfusion reactions. The donor was counseled, issued a special donor card indicating the presence of anti-K antibody, and advised to inform healthcare providers during future medical treatments. Future steps include broader surveillance to identify similar rare antibodies in donors and reinforcing awareness among transfusion services.

Past Triumphs & Future Horizons
TRANSCON 2025

PP 21

COMPARISON OF DIFFERENT BLOOD BANK SOFTWARE USED AT OUR CENTRE

Authors:

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Background: Blood bank management software is a specialised digital tool designed to streamline the operations of blood banks. It helps manage donor and patient records, blood inventory, testing, component separation and distribution in compliance with statutory requirements. The software increases efficiency, traceability, and safety in blood donation, storage, and transfusion processes. This study compared three different software used at our centre. By systematically assessing these key features, this is an attempt to highlight the main advantages and disadvantages of the 3 software used in our centre. Methods: Three different blood bank software (named A, B and C) have been used in our blood centre from 2008 to 2025 (till now). We tried to compare user-friendliness, overall functionality, interface facility, system integration capabilities, and data security features of these software. Furthermore, the software's adherence to regulations, ability to process transactions, reporting and analytics tools were also evaluated. These features include Donor registration and management, Blood collection, patient management, Testing Inventory management, Stocks, Compliance and safety, Reporting, Interface, Backup, Real-time data access. Results: When we compared three different software, some points were common to all the software. Some things were new in the software currently being used because technology has updated. The good thing is cloud based storage facility (no need for physical server). The bad thing is that internet is mandatory; during power cut, everything has to be done manually, and there is a possibility of system hacking. All softwares have reports as per FDCA rules were there and can be printed from software directly such as Donor Registration Register, Donor Blood Group & Antibody Screening Register, Patients Blood Grouping & Antibody Screening Register, Compatibility (Cross Match) Register, Blood Issue Register, Master Register, Component Preparation Register, Patients Request Register, Stock Report, TTI Testing Register. Entries were simple and possible in a single step in some software and cumbersome in others. Some functionality, like remove donor from the calling list, was not possible in one software. Some customised reports were not available in some software. Regular updates on software are not done immediately according to need or when statutory guidelines change. Conclusions: We have to accept the limitations of old software, security, and current new technologies. Cloud-based solutions can increase operational efficiency and data recoverability, but require a robust internet infrastructure, offline backups, and well-trained users to ensure resilience and protect sensitive information. The purpose of this study was to determine which software, by using or modifying it, could reduce the difficulties encountered in running a blood centre. Unfortunately, we have yet to find software that can satisfy user needs along with all statutory requirements. We have yet to find a single software which fulfils the demands of each and every blood centre.

PP 22

QUALITY CONTROL OF PLATELET CONCENTRATES PREPARED BY DIFFERENT METHODS

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Background: Platelet concentrates are essential blood components prepared by platelet-rich plasma (PRP) and buffy coat (BC) methods. Their quality is evaluated using parameters like platelet count, WBC/RBC contamination, volume, and pH. Aim: To compare the quality of platelet concentrates prepared by PRP-PC and BC-PC methods using various hematological and physical quality control parameters. Methods: As a mandatory procedure of carrying quality control of 1% products in a blood centre, 160 platelet samples (100 PRP-PC and 60 BC-PC) were checked from Jan 2022 to Apr 2025. Blood was collected, processed, and quality checked using standard procedures and instruments. Results: Both methods maintained acceptable pH and swirling. BC-PC showed higher platelet yield with a mean of 7.42 ± 1.80 x 1010than PRP-PC (6.31 ± 1.61 x 1010) and lower WBC contamination with a mean of 0.32 ± 0.26 x 108 than PRP-PC (0.50 ± 0.37 x108), indicating better efficiency and quality. Conclusion: BC-PC method is superior in platelet yield and has lower WBC contamination, making it a more effective and safer method for platelet concentrate preparation.

Past Triumphs & Future Horizons
TRANSCON 2025

PP 23

INTRAUTERINE TRANSFUSION AND PARTIAL EXCHANGE TRANSFUSION FOR TWIN ANEMIA-POLYCYTHEMIA SEQUENCE: A RARE BUT ESSENTIAL TRANSFUSION MEDICINE PERSPECTIVE

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Background: Twin Anemia Polycythemia Sequence (TAPS) is a rare complication of monochorionic twin pregnancies, characterized by chronic, unbalanced inter-twin transfusion through placental vascular anastomoses. This leads to severe anemia in the donor twin and polycythemia in the recipient twin. Intrauterine transfusion (IUT) remains the cornerstone in managing the anemic twin. However, treating the recipient polycythemic twin is equally critical to prevent hyper viscosity-related complications by Partial exchange transfusion This case report highlights the successful management of a monochorionic diamniotic twin pregnancy complicated by stage 4 TAPS using serial IUTs for the donor twin and PET for the recipient twin, offering a practical perspective on a multidisciplinary transfusion approach. Case Report A 30-year-old primigravid was referred at 30 weeks of gestation with ultrasound findings suggestive of stage 4 TAPS. Doppler showed elevated middle cerebral artery peak systolic velocity (MCA-PSV)(<0.55 MOM) in the donor twin (Twin A) while the recipient twin (Twin B) had reduced blood velocity with fetal growth restriction and congenital cardiac anomalies. Optimal treatment strategy for the patient was decided after comprehensive multidisciplinary discussions .IUT was planned for the anemic twin and PET for the polycythemic twin after obtaining informed written consent. The mother's blood group was O RhD positive. Fresh (<5 days old), O negative, irradiated, leukodepleted, saline-adenine-glucose-mannitol (SAGM) reduced crossmatch-compatible red cell units were used for IUT. IUT was performed under ultrasound guidance targeting the portal vein. Blood volume was calculated using standard fetal weight and hematocrit formulas. PET was performed using normal saline via the same approach. Twin A underwent three IUT procedures at 30, 31, and 33 weeks of gestation. Pre-transfusion hemoglobin levels ranged from 4.1 to 7.1 g/dL, improving post-transfusion to 15.4–16.8 g/dL, with corresponding hematocrit normalization. Twin B underwent PET at 31 and 33 weeks to address extreme polycythemia, successfully reducing hematocrit from 75.6% to 66.6% with each procedure. Both fetuses tolerated the procedures well, and no procedure-related complications occurred. At 34 weeks, the twins were delivered via elective cesarean section. Twin A weighed 1.48 kg and Twin B 1.3 kg. The donor twin had an uneventful neonatal course, while the recipient twin required further management for Tetralogy of Fallot with pulmonary atresia. Conclusion: This case highlights the role of targeted transfusion strategies in managing severe TAPS. Serial IUTs effectively corrected donor anemia, while PET mitigated recipient polycythemia, preventing hyperviscosity complications. Effective management of this rare and life-threatening condition relies on a multidisciplinary approach integrating fetal medicine and transfusion expertise. Early diagnosis, timely procedural planning, and vigilant monitoring are essential to improve neonatal outcome.

PP 24

IN VITRO EVALUATION OF CLOTTING TIME ON ROTEM AFTER CORRECTION WITH PLATELET-RICH PLASMA AND FIBRINOGEN IN POST–LIVER TRANSPLANT PATIENTS

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Background: Rotational thromboelastometry (ROTEM) serves as an invaluable point-of-care tool for monitoring coagulation in liver transplant (LT) recipients because conventional coagulation tests (CCT) often fail to accurately reflect the true hemostatic status. Clinically, in post-liver transplant patients, we observed a discordant situation in which patients, despite having a normal INR, continue to exhibit prolonged clotting time (CT) on ROTEM analysis and also show reduced maximum clot firmness (MCF). This study aimed to evaluate whether the in-vitro correction of fibrinogen levels and platelet counts has any effect on clotting time. Methods: This study was a single-center, prospective investigation conducted at a quaternary care liver transplantation center following the approval of the ethics committee (IEC No ECR/1276/Inst/TN/2019/2025/354). The study included post-liver transplant patients who exhibited low maximum clot firmness (MCF) (<35 mm), prolonged clotting time (CT) (>100 s on ROTEM), and an international normalized ratio (INR) <3.5 on conventional coagulation tests (CCT). Blood samples were collected prior to any clinical transfusion interventions after obtaining informed consent. Platelet-rich plasma volumes of 0.2 mL and 0.3 mL increased the count by ~100,000 and ~150,000 cells/mm^3, respectively and reconstituted fibrinogen concentrate volumes of 0.15, 0.3, and 0.45 mL resulted in incremental fibrinogen increases of 100, 200, and 300 mg/dL, respectively when added to the patient's blood samples in three separate tubes in vitro. ROTEM testing was subsequently repeated for each modified sample. Linear regression analysis, Pearson correlation and Bland Altman test were the statistical tools used for data analysis. Results: Six post-liver transplant patients were included in the study, resulting in a total of 24 ROTEM analyses (comprising a baseline and three corrected samples per patient). The median baseline CT was 153 s (range, 107–268 s), CFT was 723 s (range-507 -2675 s), and MCF was 29 mm (range, 21–34 mm). All ROTEM values demonstrated improvements in CT when CFT and MCF were corrected in vitro. Except in three instances, the values remained static. The increase in CT was negatively correlated with the increase in MCF (r = -0.75; p<0.001) and positively correlated with CFT (r= 0.93; p<0.001). Based on the regression analysis, it can be inferred that for each millimeter decrease in MCF, CT increases by approximately 3 s, or for every 10-second increase in CFT, there is an associated 1-second increase in CT. Conclusion: This in vitro study revealed that post-liver transplant patients exhibit prolonged clotting times despite having a normal International Normalized Ratio (INR), which may be attributed to reduced MCF. Normalization of MCF was achieved through the in vitro addition of fibrinogen and platelets Aalong with improved CT, and CFT. Further a larger sample size is required to validate this hypothesis and to define the specific CFT and MCF thresholds to be considered for ROTEM based correction.

PP 25

COMPREHENSIVE EVALUATION OF TRANSFUSION-TRANSMITTED INFECTIONS: DONOR DEMOGRAPHICS AND DIAGNOSTIC MODALITIES AT A TERTIARY CARE HOSPITAL IN NORTH INDIA

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Background: Transfusion-Transmitted Infections (TTIs) significantly impact transfusion safety. This study focused on determining the seroprevalence and demographic associations of TTIs among blood donors over six years and comparing the diagnostic accuracy of Rapid tests, ELISA, and NAT. Methods: A retrospective cross-sectional study was conducted at the Department of Transfusion Medicine, Moti Lal Nehru Medical College, Prayagraj, from January 2019 to December 2024. Data from all apheresis donors and whole blood donors were included. Deferred donors were excluded. TTI screening included Rapid Diagnostic Tests, ELISA, and NAT. Data on age, gender, blood group, donation type, and TTI type were compiled and analyzed using Statistical techniques. Chi-square test was used for the association; $p < 0.05$ was considered statistically significant. Results: Out of 45,875 donors, 416 (0.91%) were reactive for at least one TTI: HBV – 322 (0.75%), HCV – 69 (0.15%), HIV – 23 (0.05%), Syphilis – 2 (0.004%), Malaria – 0 (0.00%). Significant associations were observed where replacement donors had significantly higher reactivity across all infections. HBV and HCV showed the strongest association with replacement donation ($p < 0.00001$). While Male donors were more reactive to HBV, HCV, and Syphilis. HIV was more common in 21–30 years, HBV and HCV in 31–40 years. Blood Group B showed maximum reactivity towards HBV, and Blood Group O showed maximum reactivity towards HCV, followed by Blood Group A, AB (Chi-square = 38.2, $p < 0.00001$). Rapid tests yielded the highest false-negative rates, especially for HIV and HCV. ELISA and NAT showed strong concordance, indicating better specificity and reliability. Conclusion: The TTI seroprevalence was 0.91% with HBV being most frequent. Statistically significant associations were found with donor type, gender, age, and blood group. Infection-specific patterns highlight that HBV and HCV are more associated with replacement donors and older age, while HIV peaks in younger males. Rapid testing showed poor accuracy and high false-negative rates, especially for HIV. ELISA and NAT provided reliable detection, making them essential tools for safe transfusion practices. Strengthening voluntary donation and eliminating rapid-only screening is critical for transfusion safety.

PP 26

THE ROLE OF BLOODMOBILES FOR BLOOD DONATION ON WHEELS IN THE BLOOD DONATION CHAINS OPERATIONAL LOGISTICS DURING THE COVID-19 PANDEMIC

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Background: There are two major logistical modes of conducting outdoor blood donations by the blood centres. In the first, the blood centres walk to the outdoor location preferred by the donor, which could be a permanent or makeshift arrangement (static blood donation) – hereinafter referred to as routine blood donation drives. In the second, bloodmobiles - heavy-duty vehicles having all the facilities for blood donation in them, are used for enabling blood donation on wheels – are hereinafter referred to as bloodmobile blood donation drives.
The present study was to compare the utility of the two logistical modes of conducting the outdoor blood collection operations during and before the COVID-19 pandemic. Material and methods A retrospective analysis of blood donation data of the total outdoor blood donation drives during March–November in 2020 and 2019 (9 months). The number of drives and the blood donations in the routine vs. the bloodmobile were reviewed for the purpose of better understanding operational utility. Results Overall, there was a decrease of 8.3% (n = 26/315) in the number of total outdoor blood donation drives during the pandemic. On a similar trend, but on a higher note, the decrease was 19.2% (n = 39/203) in routine blood donation drives. However, contrary to the trend, there was an increase of 11.6% (n = 13/112) in the number of bloodmobile drives. Overall, there was a decrease of 42.1% (n = 14,579/34,662) in the donations in total outdoor blood donation drives during the pandemic. On a similar trend, but on a higher note, the decrease was 46.7% (n = 13,076/27,981) in donations in the routine blood donation drives. However, worth noting that there was a decrease of only 23.5% (n = 1593/6771) in donations in the bloodmobile drives. On average, per month, there were 32.1, 18.2, and 13.8 total outdoor blood donation drives, routine blood donation drives, and bloodmobile drives in 2020 against 35, 22.6, and 12.4 in 2019, respectively. Thereby, demonstrating a trend of increase in bloodmobile donation drives (43.3% in 2020 vs. 35.6% in 2019), with odds of 1.38 (CI: 0.99-1.9), p=0.05, during the pandemic in comparison to reference data. On average, there were 2,231.4, 1656.1, and 575.3 blood donations per month during 2020 against 3,851.3, 3109, and 752.3 during 2019, total outdoor blood donation drives, routine blood donation drives, and bloodmobile drives, respectively. Thereby, demonstrating a statistically significant contribution in terms of blood donations in bloodmobile (25.8% in 2020 vs. 19.5% in 2019), with odds of 1.43 (CI: 1.4-1.5), p<0.05 during the pandemic in comparison to reference data. Conclusion The Bloodmobile complements the public outreach efforts of the blood collection agencies, both in terms of the organization of the outdoor blood donation drives and the blood donations obtained thereof. Thereby demonstrating the usefulness of “Blood Donation on Wheels” in “bridging the gap” in the outdoor blood donation drives for blood donations during the COVID-19 pandemic.

PP 27

ANALYSIS OF BLOOD COMPONENT DISCARDS IN A TERTIARY CARE BLOOD CENTRE IN CENTRAL INDIA: A RETROSPECTIVE STUDY

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Background: Blood components such as platelets, packed red blood cells (PRBCs), and fresh frozen plasma (FFP) are crucial in managing trauma, surgical procedures, and emergency medical conditions. However, a significant portion of these components are discarded due to various factors—some preventable, such as improper storage, handling errors, or quality issues, and others unavoidable, like transfusion-transmitted infection (TTI) reactivity. These discards not only represent a loss of valuable resources but also affect the overall availability and safety of blood transfusion services. This study aims to determine the frequency and specific causes of blood component discard in a tertiary care blood centre located in Central India. The ultimate goal is to identify areas of intervention to minimize wastage and promote more efficient use of blood resources. B. Materials and Methods: A retrospective observational study was conducted over a period of six months. Data pertaining to 300 discarded blood component units were collected from the blood bank's discard register. The components analyzed included platelets, PRBCs, and FFP. Each unit was categorized based on type and reason for discard. A descriptive statistical analysis was carried out to assess the frequency and percentage of each discard cause among the three component types. C. Results: Out of the 300 total discarded units, FFP accounted for the highest proportion with 138 units (46.0%), followed by platelets at 117 units (39.0%) and PRBCs at 45 units (15.0%). For Platelet discards, the most prevalent cause was absence of swirling (36 units; 30.8%), indicating inadequate quality control during processing. Other causes included expiry (17.1%), TTI reactivity (15.4%), leakage (12.8%), lipemia (12.0%), and red blood cell (RBC) contamination (10.3%). Among PRBCs, TTI reactivity was the leading cause of discard (28 units; 62.2%), followed by expiry (24.4%), leakage (6.7%), clot formation (4.4%), and lipemia (2.2%). For FFP, the primary reason for discard was leakage (75 units; 54.3%). Additional causes included TTI reactivity (18.8%), lipemia (13.0%), thawed but not issued (12.3%), and RBC contamination (1.4%). D. Conclusion: The findings indicate that a substantial number of discards arise from modifiable factors such as leakage, improper processing (e.g., swirling failure in platelets), and failure to issue components before expiry. While PRBCs had the lowest discard rate, they showed the highest TTI-reactivity. On the other hand, FFP showed the highest overall discard percentage, predominantly due to leakage. Strengthening donor screening, improving staff training, and adopting stricter quality control and storage protocols can help reduce unnecessary discards, enhancing both the efficiency and safety of blood transfusion services.

PP 28

WARM AIHA WITH RH AUTOANTIBODY SPECIFICITY: UNRAVELING A TRANSFUSION DILEMMA

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Background: Autoimmune hemolytic anemia (AIHA) is a rare hematological disorder characterized by increased red cell destruction and/ or decreased red cell survival due to autoantibodies directed against self antigens on red cells. Because these autoantibodies react with self and nonself red blood cells (RBCs), they can often obscure the presence of underlying clinically significant alloantibodies. Alloantibodies are developed in response to foreign antigens (like those from a previous transfusion or pregnancy) and can cause serious transfusion reactions if not identified. AIHA is categorized into four primary types, based on the temperature at which these autoantibodies are most reactive: Warm AIHA, Cold Agglutinin Disease (CAD), Mixed-Type AIHA and Paroxysmal Cold Hemoglobinuria (PCH). Warm autoimmune hemolytic anemia (wAIHA) is the most prevalent form of autoimmune hemolytic anemia (AIHA), accounting for 60% to 70% of all cases. It is usually caused by IgG antibodies that bind to RBC antigens and result in erythrophagocytosis by splenic macrophages or hepatic Kupffer cells. In Majority of cases, antigen specificity cannot be determined or they express pan-reactivity across antigen group making serologic identification challenging. Notably antibodies directed against Rh blood group antigens have been documented in the literature. Our study was aimed to identify and explore strategies for resolving the significant transfusion dilemmas encountered in cases of warm autoimmune hemolytic anemia (AIHA) where autoantibodies specifically target the Rh blood group system. METHODOLOGY: We discuss here three immunohematological cases involving warm autoantibodies. For each case, we performed blood grouping, Direct Anti-globulin test (DAT),Rh and Kell Extended phenotyping, and antibody screening. If the antibody screen was positive, antibody identification was then carried out. All testing was done by column agglutination technology (CAT) with glass bead microcolumns, on a fully automated immunohematology analyzer (Ortho Vision Max). Alloadsorption for adsorbing the autoantibodies was done by using in-house prepared allogeneic packed red blood cells (RBCs) of the R1R1, R2R2, and rr phenotypes. Results : All three cases presented with warm autoantibodies exhibiting broad specificity against self-Rh antigens. Specifically Case 1, a 77-year-old male, and Case 2, a 75-year-old male, were both diagnosed with warm autoimmune hemolytic anemia, and in both, the autoantibody was found to be specific for the 'e' antigen. In contrast, Case 3 involved a 45-year-old female with a known history of Lymphoma, where the autoantibody's specificity targeting the D antigen was identified .Molecular testing for the confirmation could not be performed in any of the case due to financial constraints of the patient. Therefore, autoantibody detection and specificity in our study relied purely on serological methods. CONCLUSION: The study highlights the importance of detecting the nature of the antibody whether it is alloantibody or autoantibody with antigen specificity which helps in selecting appropriate antigen negative blood units to ensure transfusion safety in AIHA patients. Cases also add valuable insights to the limited literature on warm autoantibodies that exhibit unusual antigenic specificity and their capacity to cause clinically significant hemolysis.

PP 29

AN ANALYSIS OF BIOCHEMICAL MARKERS AS THE DETERMINANTS OF COMORBIDITIES IN SICKLE CELL DISEASE

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Background: Sickle Cell Disease (SCD) multisystem condition due to dysfunctional blood rheology and veno-occlusive events. In this study, we aimed towards defining prominent biochemical markers which are the determinants of co-morbidities due to HbS levels in SCD. Methodology In this retrospective cohort study (2021-2023). We recruited SCD patients (HbAS and HbSS). We first used multivariable regression model (r2) with HbS levels as dependent variable and Hemogram variables Hemoglobin（Hb, Mean Corpuscular Hemoglobin（MCH, Total Leucocyte Counts（TLC）and Serum（S）biochemical parameters, S electrolytes, Liver Function tests （LFT, S urea, S creatinine and S iron, S Ferritin of HBAS and HBSS patients as predictor variables. We then calculated correlation coefficient （CC） of biochemical markers with HbS and performed binary logistic regression of Hb < 9g/dl with laboratory variables. We finally analysed the odds ratio （OR） of Hb <9g/dl with laboratory variables to support evidence-based transfusion recommendations. Results: In this study, OPD patients were recruited as HbSS （n=116） and HbAS （n=51。 The r2 explained 37.98% of the observations （HbS levels）. Hb （P=0.028, MCH (P<0.001, S Urea （P=0.030） prominent determinants of HbS levels. HbS showed significant CC with TLC 0.313, 0.572）; MCH 0.419(0.279,0.542）; K+ 0.175(0.016,0.326; S Urea -0.197(-0.345,-0.039; S Creatinine -0.226(-0.372,-0.069）; AST 0.295(0.145,0.432 and Alk phosphatase 0.225(0.072,0.368; D Bilirubin 0.453(0.315,0.573); Indirect Bilirubin 0.454 (0.307,0.580）; S Iron 0.217(0.006,0.409 and S ferritin 0.275(0.068, 0.459）were significantly correlated with HbS levels P<0.05. Hb<9g/dl showed OR TLC OR 1.0(0.96,1.04); Na+ 1.01 (0.83,1.21); S Creatinine 5.4 (0.21,137.3);Indirect bilirubin 1.19 (0.833,1.71), AST 1.02(0.99,1.04）were some of important associations with Hb<9g/dl Conclusions: TLC, MCH levels in Hemogram, IB and AST levels in LFT; S. Urea, S. Creatinine of KFT were significant biochemical associations with HbS levels in patients with SCD. S Creatinine a prominent biochemical association with Hb<9g/dl.

PP 30

PREVALENCE OF RH AND KELL PHENOTYPING IN BLOOD DONORS: A RETROSPECTIVE ANALYSIS FROM A TERTIARY CARE BLOOD CENTER IN NORTH INDIA

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Background: While ABO and RhD are the cornerstone of routine blood typing, assessing additional blood group antigens is essential for patient safety, especially in individuals requiring multiple transfusions. The risk of alloimmunization – the development of antibodies against transfused red cell antigens – increases with repeated exposures. The Rh blood group system, in particular, is highly immunogenic. Its antigens, including D, C, c, E, and e, are well-known for triggering the production of alloantibodies, which can result in severe transfusion reactions. Understanding the prevalence of these blood group antigens within a given donor population is important as it aids in predicting and preventing alloimmunization and also ensures compatible blood transfusion. This study aims to highlight the frequency of Rh and Kell antigens among the blood donors and to formulate a donor directory of Rh and Kell phenotyped donors to prevent alloimmunization in multi-transfused patients. Methods: A retrospective study was conducted on 20,123 blood donors in the blood center of a tertiary care hospital from 1st February 2023 to 30th June 2025 .The antigen typing for Rh antigens (D, C, c, E, and e) and Kell (K) was performed on the collected EDTA samples by SPRCA (Solid Phase Red Cell Adherence Assay) technology on a fully automated immuno-hematology analyzer system (Immucor Neo Iris). The collected data was recorded on an Excel spreadsheet and was analyzed using descriptive statistics. The results were expressed in frequency and percentage. Results: Among Rh antigens, 'e' was most common antigen (98.8%), followed by D: 92.6%, C: 83.37%, c: 62.6%, and E: 19.98%. respectively. Frequency of the K antigen was 3.61%. The most common phenotype in Rh positive donors was R1R1 (37.2%) while in Rh D negative donors, it was rr (7.15%). Conclusion The 'e' antigen was the most common antigen in our study population which correlated with studies done in other parts of India. Formulating a donor directory with knowledge of phenotype frequency in the local donor population significantly improves transfusion safety, especially for patients who are transfusion dependent or in situations where clinically significant alloantibodies are found in patient's serum, where antigen negative blood unit can be arranged using the directory.

PP 31

IMPACT OF IMPLEMENTING RADIO-FREQUENCY IDENTIFICATION TECHNOLOGY ON END-TO-END BLOOD COMPONENT MONITORING AND TRANSFUSION SAFETY: A VEIN-TO-VEIN EXPERIENCE AT A TERTIARY CARE CENTRE IN NORTHERN INDIA.

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Background: Safe blood transfusion remains a vital component of modern healthcare, yet the process is inherently complex and susceptible to human error, including mismatches, clerical inaccuracies, and lapses in temperature regulation. These issues pose risks ranging from minor complications to fatal outcomes. Radio-Frequency Identification (RFID) technology has emerged as a transformative solution to enhance safety, traceability, and efficiency throughout the transfusion chain. Unlike manual and barcode-based systems, RFID uses electromagnetic waves for non-contact, real-time tracking of blood components, allowing seamless data integration with hospital information systems (HIS). Aim & Objectives: 1. The purpose of this study is to analyse and determine the improvements in the efficiency, inventory management in real time & accuracy, workflow process, safety in the blood bank supply chain, and enhancing Patient Safety by identification of right blood product & right patient. 2. To assess the performance of RFID tags in traceability and reducing product wastage. Methodology: An observational study was conducted at a tertiary care hospital in Northern India over 21 months (July 2023–March 2025) following the implementation of the Biolog-id RFID system. Leukoreduced packed red cells (PRCs) were tagged with passive high-frequency RFID tags encoding unit-specific data, enabling real-time visibility via a on-prem server based RFID dashboard. RFID smart storage devices and Personal Data Assistants (PDAs) were deployed at key locations, including storage refrigerators and bedside transfusion areas. Integration with HIS facilitated automated alerts for expiry, temperature excursions, and inventory status. Comparative data before and after implementation were analysed using structured questionnaires and time-based performance indicators. Results: A total of 33,531 PRC units were tagged. Inventory management time reduced dramatically from 730 to 12.16 hours per year ($p < 0.001$), and the time to locate crossmatched units decreased from 60.83 to 6.08 hours annually ($p < 0.001$). Transfusion initiation confirmation, which previously required 10 minutes per instance, now takes under 20 seconds, yielding a significant reduction ($p < 0.001$). Manual ward-wise data collection was reduced from 121.6 to 3.04 hours annually. Expiry of PRC units declined significantly—from 85 units in 2021 to 47 in 2024—due to timely alerts and optimized utilization ($p < 0.001$). No cases of wrong blood transfusion were reported post-implementation, and pre-transfusion verification time at the bedside was reduced from 10 to 2 minutes. The system proved mechanically and functionally stable under refrigerated and irradiated conditions, with no haemolysis reported. Four downtime episodes (totalling 11 hours) were effectively managed via predefined backup protocols without compromising patient safety. Conclusion: RFID implementation significantly improved the accuracy and workflow efficiency of components storage and release operations, maximum patient safety and traceability in blood transfusion services. This "vein-to-vein" experience underscores the feasibility and benefits of adopting RFID in Indian healthcare settings. With strategic investments, staff training, and robust infrastructure, RFID can play a pivotal role in modernising transfusion medicine and advancing nationwide blood safety initiatives.

PP 32

THERAPEUTIC PLASMA EXCHANGE AS RESCUE THERAPY IN A CHILD WITH ANTI N METHYL D ASPARTATE RECEPTOR (NMDAR) ENCEPHALITIS: A CASE REPORT.

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Background: INTRODUCTION: Anti N methyl D aspartate receptor (anti NMDAR) encephalitis is an autoimmune neuropsychiatric disorder caused by antibodies targeting the NR1 subunit of the NMDA receptor, and is increasingly recognized in paediatric populations. The estimated global incidence is approximately 1.5 per million population per year, with higher rates reported among children and young adults. Paediatric patients typically exhibit a rapid onset of psychiatric symptoms, seizures, involuntary movements and autonomic disturbances, which frequently necessitates intervention. Immunomodulators such as corticosteroids, intravenous immunoglobulin (IVIG), and/or therapeutic plasma exchange (TPE) is associated with improved clinical and survival benefits. According to American Society For Apheresis (ASFA) 2023 guidelines, anti NMDAR encephalitis is classified as Category I, Grade 1C, denoting it as a first line therapy supported by low-quality evidence and is backed by only three case trials, ten case series, no randomized controlled trials, and no case reports. In this case report, we describe a 13 year old girl with anti NMDAR encephalitis who was refractory to steroids and IVIG but showed notable clinical improvement with TPE followed by rituximab, underscoring its potential benefit. CASE DESCRIPTION: A previously healthy 13-year-old girl, presented one week after a brief febrile prodrome with acute onset behavioural disturbances, orofacial and limb dyskinesias, progressive drowsiness, and reduced responsiveness. She was admitted to Paediatric ICU and was empirically started on high-dose IV methylprednisolone. Contrast Enhanced Magnetic Resonance Imaging (CEMRI) of brain revealed right parieto-temporal hyperintensity and early Electroencephalogram (EEG) showed generalized delta slowing. As the findings suggested autoimmune encephalitis picture, IVIG was added on Day 2. Cerebrospinal fluid (CSF) and serum tested positive for anti-NMDAR antibodies, confirming the diagnosis. Anticonvulsants and sedatives were also added on due course for repeated seizure episodes. Abdominal imaging was done to rule out ovarian teratoma, which incidentally exposed multiple renal cysts. Despite IVIG and high dose steroids, her Glasgow Coma Scale (GCS) remained suppressed. Thereafter, TPE was initiated as per ASFA guidelines and was performed via right femoral vein access. Each session involved the exchange of approximately 1.5 to 2 plasma volumes with a fluid balance maintained at 100% replacement. Acid citrate dextrose (ACD) was used as the anticoagulant, and intravenous calcium gluconate was administered to prevent citrate-induced hypocalcaemia. The replacement fluid used was Albumin and two fresh frozen plasma (FFP) was given at the end to prevent dilutional coagulopathy. A total of seven TPE sessions were carried out over a period of two weeks, which resulted in MRI resolution of parieto-temporal lesions. During the course, she developed intermittent fever and was treated with culture-driven antibiotics. Once afebrile, she was given three doses of Rituximab over a period of three weeks after the last TPE session. Following treatment, she gradually regained consciousness and motor functions, and by one month after her final TPE session was able to take oral feeds, ambulate with minimal support, and was discharged in stable condition on maintenance steroids and anti-epileptics. CONCLUSION: This case emphasizes that the timely initiation of TPE alongside corticosteroids and IVIG as the initial first line therapy.

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PROSPECTIVE EVALUATION OF ANTI-CMV ANTIBODIES IN BLOOD DONORS: LINKS TO BLOOD GROUP AND DEMOGRAPHICS

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Background: The seroprevalence of Cytomegalovirus (CMV) in blood donors holds significant relevance, especially for high-risk recipient groups such as immunocompromised patients, transplant recipients, and low birth weight neonates. The aim of this study was to evaluate the association of ABO blood group, age, gender, and geographic background with the levels of anti-CMV IgG and IgM antibodies among whole blood donors. METHODOLOGY: This prospective study was conducted on 2,110 whole blood donors between November 2024 and January 2025. The association between anti-CMV IgG and IgM antibody levels and donor characteristics including ABO blood group, age, gender, and geographic background was analyzed using Kruskal Wallis test, linear regression analysis, Spearman's rho correlation coefficient, and independent t-test.

A p-value of <0.05 was considered statistically significant. OUTCOME: Out of 2,110 participants, 98.4% (n=2,076) were males and 1.6% (n=34) were females. The most common blood group was B (34.64%), while AB was the least common (8.15%). Among the ABO blood groups, individuals with blood group O had the highest mean anti-CMV IgG levels (64.76 ± 63.18), whereas those with AB had the lowest (63.23 ± 74.00). Inter-group comparison of IgG levels among different ABO groups using the Kruskal-Wallis test revealed no statistically significant difference ($p = 0.516$). Comparison of IgG levels between males and females using the independent t-test showed a statistically significant difference ($p = 0.027$). However, no significant difference was observed in IgG levels between donors from rural and urban areas ($p = 0.403$). However, mean IgG levels were higher in urban donors (69.56±68.41) as compared to rural donors (65.73±63.75). Linear regression analysis demonstrated that IgG levels increased with age, whereas IgM levels decreased. Additionally, Spearman's rho correlation showed a significant positive correlation between age and IgG levels ($p = 0.007$), while the correlation with IgM levels was not statistically significant ($p = 0.173$). CONCLUSION: Studying the association of anti-CMV antibodies levels with ABO group and demographic characteristics helps in understanding donor pool dynamics and enhances transfusion safety. It supports the targeted recruitment of CMV-negative donors, especially in regions with high CMV prevalence, and contributes to personalized transfusion practices for at-risk patient populations.

PP 34

MANAGING MYASTHENIC CRISIS AFTER VIDEO-ASSISTED THORACOSCOPIC THYMECTOMY WITH THERAPEUTIC PLASMA EXCHANGE: A CASE STUDY

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Background: Abstract: Myasthenia gravis (MG) is a chronic autoimmune disorder characterized by fluctuating muscle weakness. Thymectomy is a common intervention, particularly in patients with thymoma. We report the case of a 24-year-old female with early-onset MG who underwent video-assisted thoracoscopic thymectomy (VATS). Despite preoperative optimization with therapeutic plasma exchange (TPE), she developed a postoperative myasthenic crisis requiring intensive care. Early recognition and prompt postoperative TPE led to rapid recovery, avoiding prolonged mechanical ventilation. This case underscores the dual role of TPE as both a preoperative and rescue therapy, emphasizing the importance of individualized perioperative planning.

It highlights the need for vigilance, early intervention, and multidisciplinary coordination to manage high-risk MG patients effectively. Additionally, careful selection of perioperative medications, including antibiotics, is essential to avoid agents known to exacerbate MG symptoms and trigger crisis. Background: Myasthenia gravis (MG) is a chronic autoimmune neuromuscular disorder characterized by fluctuating skeletal muscle weakness. In MG patients with thymoma, thymectomy is often indicated. Myasthenic crisis remains a severe postoperative complication that requires rapid and effective intervention. This case report explores the dual role of therapeutic plasma exchange (TPE) in both preoperative stabilization and postoperative crisis management. Methods: A 24-year-old female with early-onset generalized MG presented with progressive limb weakness, bulbar symptoms, and was diagnosed with thymoma via CT imaging and biopsy. She underwent preoperative management with pyridostigmine, prednisolone, and three sessions of TPE. Following clinical improvement, she underwent video-assisted thoracoscopic thymectomy (VATS). Postoperatively, she developed respiratory failure indicative of a myasthenic crisis, necessitating mechanical ventilation. Six additional sessions of TPE were initiated in the intensive care setting. Results: In the present case, TPE provided dual clinical benefits—first, as a preoperative immunomodulatory strategy to stabilize the patient before thymectomy, and later, as a rescue intervention during a postoperative myasthenic crisis. Preoperative TPE allowed surgical readiness by improving muscle strength and functional status. Post-thymectomy, the patient experienced worsening ptosis, diplopia, and generalized weakness. Early recognition of myasthenic crisis led to prompt ICU admission and ventilatory support. Postoperative TPE contributed to rapid neurological recovery, allowing successful extubation after the third session. By the sixth session, the patient had returned to an Eastern Cooperative Oncology Group Performance Status (ECOG) performance status of Grade 1, indicating near-complete functional recovery. The case also highlighted a temporary exacerbation associated with fluoroquinolone use post operatively, an antibiotic known to worsen MG. Discontinuation of the drug led to symptom stabilization, underscoring the importance of judicious antibiotic use and clinician awareness of medications that may aggravate MG. Conclusions: This case underscores the value of TPE not only as a preoperative immunomodulatory measure but also as a critical intervention during postoperative myasthenic crisis. The successful outcome illustrates the importance of individualized perioperative planning, early crisis detection, and multidisciplinary care. TPE remains a key therapeutic modality in crisis mitigation and management for high-risk MG patients undergoing thymectomy.

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SERO-PREVALENCE AND POTENTIAL CORRELATION OF TRANSFUSION-TRANSMITTED INFECTIONS WITH ABO BLOOD GROUP SYSTEM AMONG HEALTHY BLOOD DONORS IN EASTERN INDIA.

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Background: Transfusion-transmitted infections (TTIs) remain a significant concern in transfusion medicine due to their impact on blood safety. Understanding the distribution of TTIs among blood donors and exploring potential associations with the ABO blood groups system can enhance donor screening strategies. Methodology: This cross-sectional retrospective study was conducted on Blood donors who donated whole blood from January 2020 to December 2024 at our blood centre. Blood donors' blood was tested for ABO and Rh D grouping and five mandatory TTI markers as per the Drugs and Cosmetics Act. A chi-square test was performed to look for any association of TTIs with ABO and Rh D blood groups. Outcome: 65160 healthy donors were screened for TTI, and 2167 (3.33%) were positive for various TTIs. Hepatitis B had the maximum prevalence (1017 cases, 1.56%), followed by Syphilis (655 cases, 1.01%), Hepatitis C (268 cases, 0.41%), HIV (188 cases, 0.29%), and co-infection (39 cases, 0.06%). Maximum TTI seroreactive donors were found among 'B' blood group (3.27%, 776 cases), followed group 'O' donors (3.35%, 719 cases), 'A' donors (3.38%, 482 cases), and 'AB' donors (3.34%, 190 cases), respectively. However, the overall risk of association of TTI was not statistically significant with ABO and Rh D blood group, except that HBsAg was statistically significant with B blood group. Conclusion: Hepatitis B was the most prevalent transfusion-transmitted infection among blood donors, with a statistically significant association observed between HBsAg positivity and blood group B. This underscores the urgent need for continuous public health initiatives, focused awareness campaigns, and rigorous donor screening procedures to improve transfusion safety, minimize transfusion-transmitted infections (TTIs), and protect both donors and recipients from preventable health risks associated with unsafe blood transfusion practices.

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RED CELL RISKS IN PREGNANCY: CASE OF ANTI-C ALLOIMMUNIZATION AND HYPERHEMOLYSIS IN SICKLE CELL TRAIT

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Background: Sickle Cell Disease (SCD) is a hereditary hemoglobinopathy resulting from a point mutation in the β-globin gene. Sickle Cell Trait (SCT), its heterozygous counterpart, is generally asymptomatic but can predispose individuals to rare complications. In India, SCT prevalence varies widely by region and ethnicity, with central India—home to the largest tribal population—showing rates up to 33%. Despite SCT's generally benign nature, pregnancy in affected individuals can present unforeseen risks, particularly when complicated by red blood cell (RBC) alloimmunization. Case Presentation: A 30-year-old multiparous woman at 31 weeks of gestation with known SCT presented with prolonged fever and recent jaundice. Notably, she had received a prior blood transfusion due to critically low hemoglobin levels (3.6 g/dL). On admission, her hemoglobin remained low at 4.3 g/dL with hyperbilirubinemia, suggesting ongoing hemolysis. Immunohematologic evaluation revealed she was O Rh(D) positive and harbored anti-c alloantibodies, confirmed through extended antibody screening. Initially, transfusion with antigen-matched PRBCs improved her hemoglobin to 9.0 g/dL. However, subsequent transfusions paradoxically reduced her hemoglobin to 2.6 g/dL, indicative of hyperhemolysis syndrome (HHS), a rare but serious delayed hemolytic transfusion reaction. Management and Outcome: Transfusions were halted, and the patient was treated with immunosuppressive therapy comprising intravenous immunoglobulin (IVIG) and corticosteroids. Her clinical status stabilized, enabling safe reintroduction of transfusions with further antigen-matched PRBCs. Serial Doppler studies ruled out fetal anemia. At 32+2 weeks, she delivered a preterm female infant by cesarean section. Neonatal evaluation revealed blood group B Rh(D) positive with absence of c-antigen, excluding anti-c-mediated hemolytic disease of the fetus and newborn (HDFN). The infant developed mild jaundice, which was effectively managed with phototherapy. Both mother and child were discharged in stable condition. Discussion: This case underscores two rare but dangerous phenomena—anti-c alloimmunization and HHS—in a pregnant woman with SCT. The Rh blood group system, particularly the c-antigen, is implicated in HDFN and hemolytic transfusion reactions despite routine antenatal screening focusing mainly on Rh(D)-negative pregnancies. HHS, often overlooked, is characterized by destruction of both transfused and autologous RBCs despite absence of new antibodies or Coombs positivity. Mechanistically, it involves macrophage hyperactivation and complement-mediated hemolysis. Clinical Implications: SCT pregnancies, although often classified as low-risk, may entail severe transfusion-related complications. The case advocates for: • Universal antibody screening irrespective of Rh(D) status • Antigen-matched, leucodepleted blood transfusions • Multidisciplinary collaboration among hematology, transfusion medicine, obstetrics, and neonatology Conclusion: Pregnancies complicated by SCT and prior transfusions warrant vigilant monitoring. Early identification of alloantibodies, informed transfusion strategies, and coordinated care pathways are crucial to mitigate risks. Anti-c alloimmunization and HHS, though rare, can be life-threatening but are manageable with timely, targeted interventions.

PP 37

CYTOMEGALOVIRUS SEROPREVALENCE AMONG BLOOD DONORS IN GUJARAT

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Background: Cytomegalovirus Seroprevalence among Blood Donors in Gujarat Rakhee Shah, Dr Ripal Shah, Dr. TejalChhabria, Technical Coordinator, Medical Director, Transfusion Medical Specialist Background: Cytomegalovirus (CMV) infection is a concern among blood bank professionals and blood transfusion recipients, particularly in cases of transfusion to neonates and immunocompromised patients. In India, screening donated blood for infections is mandatory for human immunodeficiency virus, hepatitis B, hepatitis C, malaria, and syphilis, but not for cytomegalovirus (CMV). Studies have shown a high seroprevalence of CMV (up to 95%) in India, and CMV can cause severe morbidity in susceptible individuals such as immunosuppressed patients and neonates. Hence, providing CMV-negative blood units by screening for CMV and maintaining a donor database of seronegative donors is crucial in this setting. Objective: The study aimed to investigate the seroprevalence of cytomegalovirus in healthy Voluntary blood donors in Gujarat. Material and Methods:
This study was undertaken to find out the seroprevalence of Cytomegalovirus at a Stand-alone blood center, from May 2017 to May 2018, among 5302 blood donors in Gujarat, mainly in Ahmedabad. Results: Among the 5302 samples tested for CMV, 5034 were seropositive, and 268 samples gave a negative reaction. Hence, the seroprevalence of CMV among our donor population was 95%. The incidence of cytomegalovirus was 95% for IgG and 4.7% for IgM in healthy donors who donated from May 2017 to May 2018. Results revealed CMV IgG reactivity in 95% of the blood donors, while 4.77% had detectable CMV IgM reactivity, and 5% of donors were negative for both IgG and IgM. Conclusion: Prospective blood donors should be screened for CMV, especially when transfusion is intended for immunocompromised recipients. Leucoreduced blood products from CMV-seronegative donors should be given to preterm neonates and infants to prevent transfusion-associated perinatal CMV disease. There should be more campaigns and awareness programs promoting the voluntary donation of CMV-negative blood. Community education programs should be implemented to raise awareness about the significant impact of CMV infection on health. Keywords: Cytomegalovirus (CMV), Blood donor, Seroprevalence, Immunoglobulin G (IgG), Immunoglobulin M (IgM).

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THE ROLE OF EXTERNAL QUALITY ASSESSMENT SCHEMES IN MONITORING AND IMPROVING THE STANDARDIZATION PROCESS IN A STANDALONE BLOOD CENTER.

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Background: The role of External Quality Assessment Schemes in Monitoring and Improving the Standardization Process in a standalone blood center. Disha Patel, Dr RipalShah, Dr. Tejal Chhabria, Lab Coordinator, Medical Director, Transfusion Medical Specialist Abstract: Introduction: External Quality Assessment Schemes (EQAS) are essential tools in transfusion medicine for maintaining high standards and ensuring the accuracy of laboratory results. In the Standalone Blood Center, the External Quality Assessment Scheme (EQAS) helps monitor, evaluate, and continuously improve testing procedures. Materials and Methods: Data were collected from BEQAS samples received from March 2019 to March 2024 at our center for the study. Quarterly, blind samples were received and tested for parameters including ABO and Rh (D) grouping, antibody screening and identification, hemoglobin estimation, and transfusion-transmitted infection (TTI) markers.

All results were evaluated against BEQAS benchmarks to identify discrepancies and trigger corrective actions when necessary. Results: Over the five years, the centre's consistency achieved excellent performance, with 100% accuracy in most parameters. Minor Deviations (98.07% and 96.15%) occurred in hemoglobin estimation during specific quarters, which were promptly investigated and addressed. Notably, rare antibodies were successfully detected, demonstrating the robustness of testing protocols. Conclusion: Regular participation in BEQAS significantly enhanced the quality assurance process at the standalone blood center. The scheme not only identified areas needing improvement but also reinforced confidence in reporting accurate results. EQAS remains a critical component in ensuring safety, reliability, and standardization in blood transfusion services.
Keywords: Quality assurance (QA), internal quality control (IQC), Blood center External quality assessment scheme (BEQAS).

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DONATING HOPE: A RETROSPECTIVE REVIEW OF UNRELATED PBSC DONATIONS ORGANIZED BY DKMS INDIA AND THE CHALLENGES

Authors:

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DKMS Foundation

Background: In India, the probability of finding a matched sibling or related donor for blood stem cell transplantation remains low—only around 25%–30%. • This underscores the critical importance of unrelated donor registries in bridging the gap for the vast majority of patients with life-threatening blood disorders such as leukemia, thalassemia, and aplastic anemia. • DKMS Foundation India has significantly contributed to expanding access to unrelated donor transplants by registering 213,233 potential donors (as of May 2025), including 149,974 males and 63,259 females. • DKMS Foundation India has made significant contributions in India by facilitating extensive donor registrations; leveraging high-resolution HLA typing; effective organization of blood stem cell donations; and transporting blood stem cell products to the transplant centers throughout India and across the world. AIM: • This study aims to retrospectively review peripheral blood stem cell (PBSC) donations facilitated by DKMS India between January 2016 and May 2025 and to analyze the key operational, logistical, and communication-related challenges faced by Case Managers in coordinating successful donations. METHODOLOGY: • The study included all Confirmatory Typing (CT) requests received from both Indian and international transplant centers and the PBSC donations coordinated by DKMS India across five NABH-accredited collection centers. • Additionally, feedback was obtained from Case Managers who were directly responsible for coordinating each donation. • The collection centers included BMST (Bangalore), Rela Hospital (Chennai), Fortis Mulund (Mumbai), Tata Medical Center (Kolkata), and Max Super Specialty Hospital (Vaishali, Delhi NCR). OUTCOME: • Received 3,126 Confirmatory Typing (CT) requests between Jan 2016 and May 2025. • Successfully facilitated 187 unrelated PBSC donations during the same period. • Collaborated with five NABH-accredited collection centers across India for donations. • Provided donors with logistical support for travel, stay, and hospital coordination. • Case managers played a critical role in navigating these challenges and ensuring a smooth donor-to-patient pathway. Challenges: Case managers commonly face several obstacles, including: • Donor unavailability due to low awareness, fear of GCSF injections, and lack of family support. • Geographic limitations in access to collection centers. • Complex coordination of donor travel and medical procedures. • Organizing logistics of product transport from the collection center to national and international transplant centers • Time constraints from repeat tests and sudden changes in transplant schedules. • Last-minute cancellations from transplant centers, even during GCSF administration. • Medical deferrals due to donor-related health concerns. CONCLUSION: • Co-ordinating unrelated PBSC donations in India presents significant donor availability, operational and logistical challenges. • Case Managers serve as a vital link between donors and recipients, ensuring ethical and timely coordination - from recruitment to product delivery. • Public awareness, donor education, and family engagement must be strengthened. • Streamlining donation procedures, improving donor support systems, and diversifying donor registries can significantly enhance transplant success rates.

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QUALITY INDICATORS AS A TOOL FOR CINTINOUS QUALITY IMPROVEMNT AT A TERTIARY CARE HOSPITAL BLOOD CENTRE

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Background: Blood transfusion services play crucial role in patient health care management.-Ensuring the quality in transfusion services has become essential part of QMS. -QMS includesthe organized structure, responsibilities, policies, procedures and resources established by the management to achievev and maintain quality. -The present study was conducted to measurethe impact of monitoring quality indicators and how they could be used as a tool for continous quality improvement(CQI). Aims and Objectives: To evaluvate the quality indicators(QI's) and analyze the effectiveness of transfusion services at our blood centre. Methodology: In this retrospective study, the data collected for a period of two years (2023-2024) at our blood centre. The parameters used in the analysis were based on quality indicators defined by National Accreditation Board for Hospitals & Healthcare Providers(NABH) QULAITY INDICATORS: 1.TRANSFUSION-TRANSMITTED-INFECTIONS(TTI %) (Combined TTIcases [HIV+HBV+HCV+Syphilis+MP] / Total number of donors) x100 2. Adverse transfusion reaction rate (ATRR%) (No. of adverse transfusion reactions/Total no. of blood and components issued) x 100 3. Wastage rate % (No. of blood or blood components discarded/Total no of blood or blood components issued) x 100 4. Turn around Time (TAT) of Blood Issued- (Sum of the time taken/Total no of blood blood components crossmatched or reserved) 5. % of components usage (Total component issued/Total whole blood component issued)x100 6. Adverse Donor Reaction Rate %(ADRR) (No. of donors experiencing adverse reaction/Total no of donors) x 1007. Donor Deferral Rate % (No. of donor deferrals/Total no. of donation + total no of deferrals)x100 Results- On evaluvation , Transfusion transmitted infections (TTI) was 1.55%, Adverse transfusion reactions rate(ATRR) was 0.20% components issued was 99.9% and net wastage was 1.75% . Turn around time for routine and emergency issues was found to be 1.25 % and donor deferral rate was 8.78% . CONCLUSION : The study results concluded that blood transfusion services at our blo.

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DOUBLE TROUBLE – AN UNUSUAL TACO IN SEPTICEMIC SHOCK; ATYPICAL CLINICALPRESENTATION & A MIRACULOUS RECOVERY STORY

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Background: CASE PRESENTATION INTRODUCTION TACO is a non-infectious serious hazard of transfusion and leading cause of transfusion related mortality and morbidity, within 6 hours of transfusion. TACO frequently occur in patient who are unable to compensate for an increase in circulatory overload. TACO occurring in hypovolemic shock case is extremely rare and diagnostically challenging due to its paradoxical clinical features. Timely recognition and proper management is very essential for positive patient outcome. CASE PRESENTATION 3O year old female presented to our casualty with chief complaints of profuse bleeding PV and generalized fatigue. She took Medical Termination Pregnancy kit (MTP) illegally from local hospital when she confirmed UPT positive. She started bleeding since the next day of MTP conception,6-7 pads/day with clots. Patient got admitted basic investigations done, blood products were arranged and posted for emergency D&C under anaesthesia with broad spectrum antibiotic coverage and IV fluids. Vitals were stable initially later bleeding became uncontrollable and BP started to fall, 2 unit of whole blood transfused initially later 3 unit of PRC and 2 unit of FFP transfused within 14 hours of admission. Bleeding became controllable but BP raised transiently till 180/100 mmHg & CVP raised to 14mmHg with new onset dyspnoea and chest pain, saturation dropped to 88% on Room air. Gradually patient's BP started to fall with high grade fever and went into shock. Chest Xray shows pulmonary infiltrate, CECT Thorax suggestive of pulmonary oedema and elevated pro BNP level confirmed TACO.CBC report shows elevated TLC-40k and Blood culture report shows Group A Streptococcus, with fall in BP s/o septicaemic shock. MANAGEMENT Transfusion reaction workup done which was negative. Oxygen therapy & IV Furosemide given, shifted to ICU kept on CPAP ventilator, patient's dyspnea and chest discomfort improved. Patient developed high grade fever, managed with IV antipyretics and BP started to reduce and went into shock for which IV inotrope infusion started and hourly monitoring and dose adjustment done, IV antibiotics continued. Patient vitals became normal after 2 days. Inotropes dose tapered and weaning from CPAP was initiated and then shifted to ward. CONCLUSION TACO with septicaemic shock can occur with unusual Hypotension. Liberal Blood transfusion in critically ill patient like septicaemic shock is challenging. Judicious use of blood product as well early recognition and management of TACO like transfusion reaction is very essential for positive patient outcome.

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A STUDY TO EVALUATE AGREEMENT BETWEEN CONVENTIONAL TUBE TECHNIQUE AND FULLY AUTOMATED COLUMN AGGLUTINATION TECHNIQUE FOR BLOOD GROUPING AND CROSSMATCHING AT BLOOD CENTRE OF A TERTIARY CARE HOSPITAL

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Background: Routine immunohematological testing is essential for safe transfusion practices and can be performed using manual or automated methods. With increasing workloads and the need for standardization, automation has become a key focus in transfusion medicine. Automated platforms offer several advantages, including improved efficiency, reproducibility, and reduced human error, but also present challenges that require evaluation. The BIORAD IH-500 is a fully automated, walk-away analyzer recently introduced at our center, designed for high-throughput immunohematological testing. AIM & OBJECTIVES This study aims to evaluate the agreement between the Conventional Tube Technique (CTT) and Column Agglutination Technique (CAT) using the fully automated immunohematology analyzer (BIORAD IH-500) for blood grouping and crossmatching. MATERIALS AND METHODS This prospective pilot study was conducted using 2000 patient samples received at our blood centre for packed red blood cell (PRBC) transfusion. Samples were selected using a convenience sampling technique. Each sample underwent simultaneous testing for blood grouping by both CTT and the CAT method using the fully automated immunohematology analyzer. For patients with a valid blood issue slip, crossmatching was performed with corresponding donor PRBC units using both techniques, and the results were documented for comparison. The statistical analysis was performed using SPSS software version 30. RESULTS In blood grouping, concordant results between the CTT and CAT method using the fully automated immunohematology analyzer were observed in 1991 out of 2000 samples (99.55%), with 9 samples (0.45%) showing discordance. Agreement analysis yielded a statistically significant kappa value of 0.665. The sensitivity and specificity of the automated method were 100% and 99.5%, respectively. For crossmatching, the fully automated CAT demonstrated concordant results in 1993 out of 2000 crossmatches (99.65%), with 7 (0.35%) discordant cases compared to the CTT. The kappa coefficient was 0.923, indicating strong agreement, and was statistically significant. The sensitivity and specificity were 100% and 99.6%, respectively. CONCLUSION The fully automated immunohematology analyzer demonstrated high sensitivity, specificity, and substantial agreement with the conventional tube technique in both blood grouping and crossmatching. Its performance highlights its reliability and potential utility in routine pretransfusion testing, while also offering advantages in terms of standardization, efficiency, and reduction of manual errors.

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LIQUID GOLD IN DENTISTRY: HARNESSING THE HEALING POWER OF PLATELET-RICH PLASMA

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Background: Platelet-Rich Plasma (PRP), often termed as "liquid gold," is revolutionizing regenerative strategies in dentistry. Derived from autologous blood, PRP is a concentrated suspension of platelets in plasma enriched with growth factors such as PDGF, TGF-β, VEGF, and EGF, which play pivotal roles in wound healing, angiogenesis, and tissue regeneration. This poster presentation aims to highlight the biological principles, preparation protocols, classifications, and wide-ranging clinical applications of PRP in various branches of dentistry including oral and maxillofacial surgery, periodontology, endodontics, implantology, and prosthodontics. PRP has shown promising results in accelerating soft and hard tissue healing post-extraction, enhancing osseointegration of implants, and promoting bone regeneration in sinus lift and ridge augmentation procedures. Its application in treating periodontal defects and pulp revascularization in immature teeth is also gaining traction. Despite its proven efficacy, the variability in preparation techniques, platelet concentration, and activation methods often lead to inconsistent clinical outcomes. Hence, this presentation also emphasizes the need for standardization and evidence-based guidelines for optimal use.PRP offers a cost-effective, minimally invasive, and biocompatible solution to augment healing and improve prognosis in dental treatments. With growing clinical acceptance, PRP represents a paradigm shift toward biologically driven, patient-centered care. This presentation will serve as an informative resource for dental professionals seeking to integrate PRP into clinical practice for enhanced patient outcomes.

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STEM CELL MOBILIZATION PATTERNS AND OUTCOMES IN AUTOLOGOUS TRANSPLANT PATIENTS: A TWO-YEAR EXPERIENCE FROM A TERTIARY CARE CENTER IN INDIA

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Background: Collecting stem cells from the blood is an important step before doing an autologous stem cell transplant. The success of collection depends on the patient's condition and treatment history. In India, there is limited data about how well different methods work. This study aimed to evaluate mobilization patterns and identify factors associated with suboptimal CD34+ cell yield in patients undergoing autologous HSCT.. Methods A retrospective observational study was conducted at a tertiary care center in India over a two-year period (June 2023 to May 2025). Patients undergoing autologous HSCT for hematologic and selected non-hematologic conditions were included. Mobilization regimens included granulocyte colony-stimulating factor (G-CSF) with plerixafor, with or without chemotherapy, based on clinical judgment. Apheresis was initiated when pre-apheresis peripheral blood CD34+ count reached ≥20 cells/µL. The median pre-apheresis CD34+ count, CD34+ yield, number of poor mobilizers, and associated clinical variables were analyzed. Results There were 73 patients, including 48 males and 25 females, with an average age of 44 years (range 5-74). Most had multiple myeloma (42), followed by Hodgkin lymphoma (12), red cell aplasia (7), AML (3), and other diseases (9). G-CSF with plerixafor was used in 48 patients; 25 also received chemotherapy. The average CD34+ count before collection was 84.2 cells/µL, and the average number of cells collected was 9.1 million per kg. Six patients (8.2%) did not collect enough cells. Older age, past chemotherapy (in 4 patients), and past radiotherapy (in 2 patients) were linked to poor collection. Conclusions Most patients had successful collection using G-CSF with or without chemotherapy and plerixafor. Older age, previous chemotherapy, and radiation made it harder to collect enough cells. It is helpful to identify such patients early and adjust their mobilization plan accordingly.

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REVISITING OUT OF CORE HOURS TRANSFUSIONS IN LOW-ACUITY AREAS: A PROSPECTIVE AUDIT FROM A MULTISPECIALTY HOSPITAL IN INDIA

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Background: Out of Core Hours Transfusions (OCH-T) in low-acuity areas have raised global safety concerns due to reduced staffing, limited clinical supervision, and compromised patient monitoring. International audits, including the UK's National Comparative Audit of Red Blood Cell Transfusion and a Turkish study (2025) emphasizes that a significant proportion of overnight transfusions are not clinically justified but rather driven by workflow inefficiencies. Study Design and Methods A prospective observational study was conducted from April 2024-April 2025 in a 650-bedded multispecialty hospital in India. Transfusions initiated between 8PM and 8AM in non-ICU, non-ER wards were audited. Data were collected through integrated Electronic Health Record system and structured proformas filled by physicians and nurses. Workflow delays were categorized into six stages: pre-request, request-to-collection, crossmatch (routine/emergency), issue, transport-receipt, and transfusion time. The time gap of >12 hours at each interval across transfusion chain is considered as a potential cause of delay. A transfusion efficiency scoring (0–12) evaluated process efficiency across seven stages, and appropriateness of transfusions was assessed against institutional and international guidelines. Results Of 5,967 transfusions, 891 (14.93%) red blood cell transfusions occurred at night. The department of hemato-oncology recorded maximum transfusion (21%). An alarming 34.39% OCH-T peaked during 10PM - 12PM. Only 40.85% fulfilled urgent clinical criteria such as hemoglobin <7 g/dL or active bleeding. Workflow junctures showed statistically significant differences (<0.001) between core and OCH-T. A concerning 2.91% of transfusions were deferred from daytime to the night despite early lab report availability, with 24.35% coinciding with nursing handovers. Pre-request delays during OCH-T were significantly higher than day time 341±306 vs 521 ± 2931 ($p<0.001$) and lack of daytime action were primary contributors. Discussion Our findings align with international audits showing a disconnect between transfusion timing and clinical urgency. Institutional culture, such as pressure to "clear lists" before morning rounds, transfusions coinciding with shift change timings frequently overshadowed patient-centred decision-making. Emergency/urgent request were processed faster indicating improved efficiency when flagged properly. Despite compliance with vital sign monitoring, night time conditions inherently raise risks, compromising safety, consistent with SHOT and other hemovigilance findings. Conclusion To mitigate these risks, we recommend institutional enforcement of "daytime-first" transfusion policies, mandatory consultant authorization for OCH-T, automated alerts for unexecuted daytime orders, and regular staff sensitization on timing-related safety concerns. The need for targeted process improvements, including digital alerts, streamlined documentation, and prioritization protocols, ensures timely transfusion support even during off-hours. Implementing a transfusion efficiency scoring system across departments can serve as a powerful internal audit tools.

PP 46

EFFECT OF BLOOD DONATION ON CARDIAC AUTONOMIC RESPONSE IN YOUNG MALE DONORS: A PILOT STUDY

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Background: Blood donation induces acute normovolemic hypovolemia that activates compensatory autonomic mechanisms to maintain cardiovascular homeostasis. These subtle changes, particularly in parasympathetic tone, may be sensitively assessed through autonomic function tests (AFTs). Despite its relevance, limited Indian data exist on immediate autonomic responses post-blood donation in healthy young male donors. This study aimed to objectively assess cardiac autonomic modulation using Ewing's battery tests before and after whole blood donation. Methodology This prospective observational study included 40 healthy male donors (aged 20–40 years, mean: 29.15 ± 5.98 years), equally distributed across ABO blood groups (A+, B+, AB+, O+; n=10 each). Pre- and post-donation measurements included: blood pressure (BP), heart rate (HR), and standardized AFTs—lying-to-standing test (30:15 ratio, ΔHR), deep breathing test (E:I ratio), and Valsalva maneuver (Valsalva Ratio). Blood donation involved 350–450 mL of whole blood. HRV (time and frequency domain) was recorded in a subset. Paired t-tests and Wilcoxon signed-rank tests were used based on data distribution (significance set at $p < 0.05$). Results Post-donation, there was a significant reduction in: - SBP (119.1 ± 7.8 to 117.0 ± 7.5 mmHg; $p = 0.048$), - DBP (73.1 ± 6.3 to 70.9 ± 6.2 mmHg; $p = 0.003$), - HR (78.8 ± 10.2 to 73.8 ± 10.0 bpm; $p = 0.005$). Among AFTs: - 30:15 ratio significantly declined (median 1.55 to 1.25; $p < 0.001$), suggesting reduced parasympathetic orthostatic responsiveness. - No significant changes in ΔHR ($p = 0.645$), E:I ratio ($p = 0.981$), or Valsalva ratio ($p = 0.962$). - Maximum Δ SBP remained unchanged (14 to 12 mm Hg; $p = 0.683$), indicating preserved sympathetic vasomotor tone. - Categorical AFT analysis showed a non-significant rise in abnormal 30:15 responses (0% to 7.5%). Conclusion Blood donation in healthy young males causes statistically significant reductions in blood pressure, heart rate, and 30:15 ratio, indicating transient parasympathetic withdrawal with compensatory sympathetic activation. Other core autonomic parameters remain stable, reflecting the cardiovascular resilience and autonomic adaptability of young donors. This supports the physiological safety of voluntary blood donation while emphasizing the utility of AFTs in donor health surveillance.

PP 47

LIQUID GOLD IN DENTISTRY: HARNESSING THE HEALING POTENTIAL OF PLATELET-RICH PLASMA (PRP)

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Background: including aims Platelet-Rich Plasma (PRP) is an autologous blood component enriched with platelets and growth factors that play a vital role in tissue repair, angiogenesis, and regeneration. Originally developed for transfusion and orthopedic use, PRP is now being increasingly applied in dentistry for accelerated healing and tissue regeneration. This study aims to explore the clinical applications of PRP in dental practice and emphasize its significance as a biologically active blood product. Methods This presentation compiles evidence from clinical studies, systematic reviews, and case series exploring the preparation techniques, classifications (such as L-PRP and P-PRP), activation protocols, and dental applications of PRP. Literature was reviewed using PubMed and Scopus databases, focusing on studies from the last 10 years involving oral surgery, periodontology, implantology, and endodontics. Results Studies indicate that PRP significantly enhances healing in post-extraction sockets, improves osseointegration of dental implants, and promotes bone regeneration in sinus lift and ridge augmentation procedures. PRP has also shown promise in periodontal regeneration and pulp revascularization. However, variation in preparation techniques and lack of standardization contribute to inconsistent clinical outcomes. Conclusions PRP represents an innovative extension of blood component therapy into dental and regenerative medicine. It offers a cost-effective, autologous, and minimally invasive adjunct to conventional treatments. There is an urgent need for evidence-based guidelines and standardization protocols to optimize its use. Transfusion medicine professionals should play a key role in promoting the safe and effective application of PRP.

PP 48

MONITORING ERRORS IN THE OUTDOOR BLOOD DONATION CAMPS; A CHECK POINT AT BLOOD COMPONENT PROCESSING LAB FOR GUIDING A MANAGEMENT SYSTEM

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Background: Organizing voluntary blood donation camps is becoming an inherent vital part of a blood transfusion service in a country like ours, where the supply-demand ratio is not stable. A successful completion of an outdoor blood donation camp helps in the maintenance of safe and quality inventory. However many errors in outdoor blood donation camps can affect safety and quality of whole blood units and ultimately blood components prepared. Thus, these errors not only lead to wastage of valuable blood units but also pose significant risks to patient safety. Objective of this retrospective observational study is to focus on the types, frequency and causes of errors happening during outdoor blood donation camps, finding the causes and their timely management to prevent recurrence. Finally to assess the effectiveness of implemented corrective and preventive actions (CAPA) Material and methods: A Retrospective observational study was conducted in the component laboratory of a tertiary hospital of north India over a period of one year. Data were collected from voluntary blood donation camp organized by the hospital blood center and the blood units were evaluated. For evaluation purpose all the VBD camps were grouped into three based on whole blood units collection (a) >100 (b) 50 to 100 and (c) 50 or less. Errors were categorized into two groups: pre-processing (from donor selection to transportation to component lab but before component separation) and processing (during component separation). Results: Pre-processing errors were more prevalent (N=34) than processing errors (N=16), especially when processing volume exceeded 100 units of whole blood. Observed pre-processing errors were, improper knotting tubing of primary blood bag (n=6), improper cold chain maintenance (n=5), mislabeled and unreadable unique identification number on the blood bags (n=6), over collected blood units (n=9), under collected blood units (n=8). In the processing errors, technical issues such as improper balancing before centrifugation of whole blood units (n=11), inline leuko-filter clogging due to fine clots (n=5) Conclusion: Through systematic categorization and root cause analysis, following causes were ascertained which were responsible for the errors in VBD camps organized in outdoor locations, scarcity of staff as compared to the workload, inadequate training of the staff, improper assessment of the equipment need like less number of blood transportation boxes and need of biomixers. The establishment of corrective and preventive actions (CAPA) was done, including assigning adequate manpower in anticipation of workload, staff training, incorporation of biomixers and additional transportation boxes. The follow up audits were conducted, and there was significant reduction in the rate of errors over time, indicating the effectiveness of these interventions in improving overall performance. Keywords Component laboratory, blood component preparation, pre-processing errors, processing errors, cold chain maintenance, labelling errors, corrective and preventive actions (CAPA), blood donation camps, error analysis, monthly audit, staff training.

PP 49

ONLINE APPLICATION OF BLOOD CENTRE LICENCE AND RELATED DOCUMENTS - JOINING HANDS WITH TECHNOLOGY WHILE SURMOUNTING CHALLENGES!!

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Background: Appropriate regulatory rules and regulations, policies and guidelines are crucial to ensure a well-regulated transfusion services across nation to facilitate easy access to blood and excise quality transfusion services. As per latest guidelines, blood centre licencing and related services ought to be applied online via Online National Drugs Licensing System (ONDLS) portal where various challenges are faced in the process. Material and methods: It was observed that it is mandatory to apply for blood centre licence on ONDLS portal to make necessary changes in it which were essential to carry out the working of the centre. The whole process was carried out in systemic way but it turned out to be more cumbersome with each step taken ahead since December 2024 to May 2025. Difficulties faced has been discussed here. Results: User manual guide, how to make the blood centre licence firm user ID using the registered contact phone number (mobile number required) and registered e-mail ID where one time password (OTP) is received for validation. First drawback sets in if the blood centre don't have a registered mobile SIM number as many of them use conventional landline telephone numbers which don't permit OTP receiving facility. Secondly, to register the blood centre, old blood centre licence need to be handy with you to enter product specifications, area etc. Thirdly, addition of technical member is only possible when all of their qualification certificates, experience certificates and their relieving from past institute till date is saved in their profile. Such documents are not handy all time such as a relieving certificate. Also, all the documents are required in the pdf form. Fourthly, a specific allotted technical member number and their appointment letter which is only available with the technical member/technical supervisor/medical officer concerned is required to add them. Member addition in unsuccessful till he accept the time limited e-mailed link. Fifth, There is no option for downloading the updated licence. Only view option is there which show limited data. Sixth, There is no provision to add counsellor/medical social worker in portal. Seventh, for post-approval changes, drop-down option lacks options such as no provision for approval for increase in the area of the blood bank, approval for preparation of new blood products. Eighth, provision is available for submission of only one post-approval application. When one application is approved by the state FDA only then option is opened for submission of second application which takes weeks to months. Ninth, no contact number is available any query resolution. Only e-mail id is provided as a means of communication. Conclusion: Since regulatory authority is constantly thriving upon to bring out transparency, accountability and uniformity in its services in order to ensure safety, efficacy and quality of the medical product manufactured, imported and distributed in the country, it is crucial to review the present status of legal and regulatory blood centre licencing policy framework so as to scrutinize various challenges and issues in the process. It also proposes the opportunities and ideas for improvement of blood.

PP 50

BLOOD DONATION- A REVOLUTION OF SOCIETAL THOUGHT PROCESS IS THE NEED OF AN HOUR

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Background: Blood donation is a selfless act that embodies the highest form of humanity—saving lives without expecting anything in return. Unlike investments, which are made with the anticipation of profit or personal gain, blood donation is purely altruistic. Voluntary blood donation remains a critical component of modern healthcare system. However, myths, misconceptions, and societal apathy continue to hinder regular donation practices. There is an urgent need to shift the societal mindset from perceiving blood donation as an occasional charity to recognizing it as a vital civic responsibility. Aim • To assess the current societal attitudes and awareness towards blood donation. • To identify barriers and misconceptions preventing voluntary blood donation. • To propose strategic interventions for transforming public perception and promoting a sustainable culture of donation. Material and Methods • A cross-sectional survey of 200 individuals from diverse demographic backgrounds. • Focus group discussions with donors and non-donors. • Data was obtained via Google form to reach out to far away community. • Analysis of data were collected using pre-validated questionnaires and analyzed using SPSS software. Results • 63% of respondents had never donated blood; major reasons included fear, lack of time, and misconceptions regarding Donation. • Only 22% were aware of the eligibility criteria and benefits of donation. • Educational interventions, awareness, counselling through providing knowledge by facts significantly improved intent to donate in 74% of previously non-willing participants. Conclusion The study highlights a critical need to revolutionize the societal thought process around blood donation. Awareness, education, and community-led initiatives are essential to dismantle myths and foster a proactive donation culture. Creating a mindset where blood donation is seen as a civic duty rather than a noble act is vital to ensuring safe and adequate blood supply for all.

Past Triumphs & Future Horizons
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A NOVEL CASE OF DETECTION OF BLOCK D PHENOMENON USING GENTLE HEAT ELUTION

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Background: Blood group discrepancies in neonates present a diagnostic challenge, particularly when maternal alloantibodies cross the placenta and coat fetal red blood cells (RBCs). This passive transfer of antibodies, most commonly IgG, can lead to false-negative antigen typing, especially for Rh(D), resulting in apparent ABO or Rh discrepancies. Traditional elution methods such as acid elution (pH ~3.0) or Lui freeze technique are frequently used to dissociate antibodies from sensitized RBCs. However, these approaches often compromise red cell integrity, leading to hemolysis and preventing repeat testing such as blood grouping and DAT interpretation. In contrast, gentle heat elution provides a non-destructive approach, preserving cell structure while effectively removing red cell bound antibodies. Methods: Initially the cord blood was typed as Rh(D) negative, while the mother was also Rh(D) negative. A strongly positive Direct Coombs Test (DAT) on the cord blood cells prompted further investigation. To identify the underlying cause, gentle heat elution was performed by incubating DAT-positive cord blood red cells with AB plasma at 45°C for 10 minutes in a water bath. After three times of gentle heat elution, the eluate was collected and tested using a commercial antibody identification panel, while the treated red cells were re-evaluated for blood grouping and DAT grading. Results: Post-elution, the neonate's RBCs were retyped and showed a clear Rh(D) positive reaction, confirming that the D antigen had been previously masked by maternal anti-D antibodies. Additionally, the DAT reactivity decreased, indicating effective removal of surface-bound antibodies. The eluate tested positive for anti-D, confirming the diagnosis of Block D phenomenon, a form of antigen masking caused by maternal all oantibodies, leading to serological false negativity in Rh typing. Conclusion: This case underscores the clinical importance of considering Block D phenomenon in neonates with unexplained Rh discrepancies and positive DAT. In contrast to other elution methods Gentle heat elution is a safe, effective, and non-invasive method to uncover masked all oantibodies without damaging red cell antigens, enabling accurate Rh typing and improving diagnostic clarity. Early recognition of such phenomena is crucial for guiding appropriate transfusion strategies and clinical management in neonates affected by hemolytic disease due to maternal all oimmunization.

PP 52

BRIDGING STAFFING GAPS: A WISN-BASED ASSESSMENT IN THE BLOOD BANK

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Background: Human resource planning in healthcare is essential for maintaining efficiency and ensuring patient safety, especially in resource-limited settings like India. Blood centers, being critical to hospital operations, require accurate staffing to handle their intensive workloads. The Workload Indicators of Staffing Needs (WISN) is a valuable tool to assess staff adequacy based on actual workload rather than outdated population-based estimations. Aim To evaluate staffing requirements in the Department of Immunohematology and Blood Transfusion at a Tertiary care hospital using the WHO-WISN method, identify any workforce imbalances, and propose corrective actions to optimize staffing. Methods This observational cross-sectional study was conducted from January to March 2025. The WISN tool was applied to the two staff categories—laboratory technicians and nursing staff within the Department of Immunohematology and Blood Transfusion. DATA on workload, activity standards, available working time (AWT), and allowance factors were collected through interviews, observation, and institutional records. Calculations followed the standard WISN methodology to determine optimal staffing numbers and WISN ratios. Results The WISN calculated staffing requirements for our blood center were found to be 10.71 (rounded to 11) for laboratory technicians and 4.12 (rounded to 4) for nursing staff. But the current workforce consisted of 9 technicians and 2 nurses, revealing a shortage of 2 staff in each category. WISN ratios were 0.81 for technicians and 0.50 for nurses, indicating high workload pressure and understaffing. Conclusions The application of the WISN method revealed significant staffing deficiencies in both technicians and nursing cadres within the blood center. Addressing these shortages through data-driven recruitment and incorporating WISN-based audits into HR policy will enhance staff efficiency, reduce burnout, and improve overall service quality.

PP 53

PRACTICAL COMPARISON OF IN-HOUSE AND COMMERCIAL ANTI-A1 LECTINS IN BLOOD GROUPING: EXPERIENCE FROM A TERTIARY CENTER IN INDIA

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Background: Lectins are proteins with hemagglutinating properties that have been utilized since the 19th century for the selective agglutination of red blood cells. The term "lectin" was first introduced by Boyd and Shapleigh in 1954 to describe sugar-binding proteins. These proteins specifically bind to carbohydrate moieties present on glycoproteins or glycolipids on cell surfaces, resulting in agglutination—an essential mechanism used in blood typing procedures within transfusion medicine. Aims This study evaluates and compares in-house Anti-A1 lectin derived from Dolichos biflorus seeds with commercially available Anti-A1 lectins in terms of cost-effectiveness, specificity, reliability, and ease of preparation. Materials and Methods Lectins were extracted from Dolichos biflorus seeds and evaluated based on their appearance, specificity, avidity, reactivity, and potency. Specificity was assessed using red cells from various blood groups, while potency was determined through serial dilutions with appropriate group cells. Results The in-house prepared lectin exhibited a clear appearance and demonstrated specific agglutination with A1 and A1B red cells, with no reactivity to A2,B,A2B or O cells. Both avidity and reactivity parameters met established standards. Potency testing yielded effective titers of 1:32 with A1 cells and 1:16 with A1B cells. The in-house prepared Lectin was stored for 48 hours when stored at 4*c. Additionally, cost analysis highlighted substantial financial savings with the in-house preparation when compared to commercially available Anti-A1lectins. Conclusion This study underscores the comparable quality of in-house-prepared Anti-A1 lectins to that of commercial counterparts. The significantly lower cost of in-house production offers a practical and economical alternative for blood centers with limited access to commercial reagents. Given their specificity and agglutination properties, lectins continue to hold valuable potential in both transfusion medicine and stem cell research. In-house prepared Anti-A1 lectin demonstrates comparable effectiveness to commercial reagents, providing a cost-effective, reliable, and easily prepared alternative for blood centers. It offers a practical solution for resolving blood grouping discrepancies, particularly in resource-limited settings. More research is to be made in regard to storage of the in house prepared lectins and preservatives for prolonged storage.

PP 54

INTERNAL QUALITY CONTROL PRACTICES IN BLOOD COMPONENTS: A RETROSPECTIVE AUDIT

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Background: including aims: In transfusion medicine, maintaining the safety, purity, and potency of blood components is critical. Internal Quality Control (IQC) ensures adherence to quality benchmarks and sustains regulatory and clinical standards. This study aimed to evaluate existing IQC practices in a tertiary care hospital blood bank and to identify areas for performance enhancement. Methods: A retrospective audit was conducted over a one-year period in the Department of Immunohematology and blood transfusion, Ludhiana. A total of 28,508 whole blood (WB) collections were collected in 450 ml top and bottom in-line filter quadruple bag (terumo) and components were made using automated component extractors (Terumo T-ACE II). As per departmental SOPs, 1% of each component batch (Leucoreduced Packed Cells, Random Donor Platelets, Fresh Frozen Plasma and cryoprecipitate) was randomly selected and tested for internal quality parameters, including volume, haematological indices, sterility, pH, coagulation profiles and swirling etc. Results: The mean Haematocrit of Leucoreduced Packed Cell's was 60.05±5.92%, volume was 287.05±20.30 ml, Hb was 16.99±2.55 g/dL, and RBC count of 6.85±1.62×106/µl. Coagulation parameters of Fresh Frozen plasma included a mean Volume of 238±20.60 ml, Fibrinogen concentration of 314.82±49.62 mg/dl, PT of 11.66±0.81 sec, Aptt (pttk) of 32.90±2.87 sec and INR was 1.06±0.08. Random Donor Platelet mean volume was 93.5±4.40 ml, pH averaged 6.98±0.17 and platelet yield had a mean of 1.20 ± 0.477×1011/unit. Cryoprecipitate show an average volume of 28.08±1.29 ml. The Factor VIII levels had a mean of 138.46±71.58 UI and fibrinogen concentrations averaged 299.40±56 mg/dl. The blood components analysed met all internal quality control standards. All cultures were negative, confirming sterility of the components Conclusions: A robust Internal Quality Control framework is indispensable for maintaining the functional integrity of blood components, minimizing transfusion-related risks, and ensuring compliance with regulatory standards. Regular IQC audits reinforce operational efficiency, patient safety, and clinical effectiveness in transfusion practices. The findings affirm the effectiveness of existing IQC protocols and suggest that structured monitoring substantially contributes to safe and efficient transfusion services.

PP 55

THROMBOCYTAPHERESIS IN A SPLENECTOMIZED PATIENT WITH HEPATITIS C–RELATED CIRRHOSIS AND JAK2-POSITIVE MYELOPROLIFERATIVE NEOPLASM.

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Background: Thrombocytosis, a hallmark of JAK2-positive myeloproliferative neoplasms (MPNs) like polycythemia vera—poses heightened thrombotic and hemorrhagic risks when platelet counts exceed 1,000 × 10/L. This is further complicated by post-splenectomy effects and hepatopathy such as hepatitis C-related cirrhosis with portal hypertension. While cytoreductive agents are standard, therapeutic thrombocytapheresis serves as an emergency intervention in extreme thrombocytosis. This case examines the multidisciplinary management of a hepatitis C–induced end-stage liver disease (HCV-ESLD) patient with JAK2-positive MPN who underwent splenectomy, developing acute hyperthrombocytosis managed via thrombocytapheresis. Case Report A 49-year-old Yemeni male with chronic HCV-ESLD underwent antiviral therapy and had portal hypertension managed with variceal ligation. Two weeks prior, he underwent an open splenectomy with proximal splenorenal shunt due to extrahepatic portal vein obstruction. His MPN, confirmed by JAK2 V617F mutation, had been managed with prior venesections. Post-splenectomy, he presented with abdominal distension, pedal edema, and a massive platelet count(PLT) of 2.53 × 10^6/µL. Other laboratory investigations were notable for leukocytosis (White blood cell count (WBC)-26,840/mm^3), haemoglobin (Hb) 12.8 gm%, and liver function tests aligning with chronic liver disease. Following informed consent, the patient underwent three sessions of therapeutic thrombocytapheresis (Optia Spectra, Terumo BCT), each processing between 1.0–1.3 total blood volumes. Anticoagulation with ACD-A (1:12) and prophylactic oral and intravenous calcium were used. Saline replacement given to maintain fluid balance, and collection efficiency averaged 40%. Therapeutic response was marked by a mean platelet reduction of 45%(38–59%) across the three procedures. Post-apheresis, the platelet count stabilized at approximately 1.41 × 106/µL. Hematologic parameters also improved, Hb 11.5 g/dL and WBC 12,440/mm3. Ropeginterferon was initiated subsequently to address the underlying MPN. Following each session, the patient experienced transient neurological episodes at varying intervals—10 minutes after the first procedure, at the end of the second, and 15 minutes before the end of the third. These episodes included severe coughing, unresponsiveness, profuse sweating, upward gaze, and bronchospasm without convulsions, necessitating ICU monitoring and intravenous levetiracetam. As a result, the second and third procedures could not be completed to the planned 1.5 total blood volume. MRI ruled out infarction, while EEG revealed focal epilepsy. The events were attributed to procedure-induced cerebral microvascular changes rather than citrate toxicity or metabolic derangements or anaphylaxis. The patient recovered fully after each episode, was initiated on anticonvulsants, and was discharged in a stable neurological condition. Conclusion This case underscores the multifactorial nature of life-threatening thrombocytosis. Thrombocytapheres is served as an effective emergency intervention to rapidly reduce platelet counts, acting as a bridge to definitive, disease-modifying therapy. However, the occurrence of post-apheresis focal seizures highlights the need for vigilant neurologic monitoring, particularly in patients with predisposing vascular conditions. Multidisciplinary coordination among hematology, hepatology, neurology, and critical care teams was crucial in achieving clinical stabilization and planning long-term management.

PP 56

ROLE OF THERAPEUTIC PLASMA EXCHANGE IN PAEDIATRIC ATYPICAL HAEMOLYTIC UREMIC SYNDROME.

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Background: Haemolytic uremic syndrome (HUS) is a life-threatening thrombotic microangiopathy (TMA) characterized by the triad of microangiopathic haemolytic anaemia, thrombocytopenia, and acute kidney injury. While the typical form of HUS is predominantly associated with Shiga toxin-producing Escherichia coli (STEC), atypical HUS (aHUS) arises from complement dysregulation, often linked to genetic mutations or autoimmune triggers, including anti-complement factor H (CFH) antibodies. A prompt diagnosis and early initiation of targeted therapy, including therapeutic plasma exchange (TPE), are crucial to improving patient outcomes. This case series describes the clinical course and therapeutic response of two paediatric patients diagnosed with autoimmune-associated aHUS—one with anti-factor H antibodies and the other with anti-PM-Scl autoantibodies. Objectives: Clinical utility of TPE in paediatric patients with autoimmune-associated aHUS and emphasizing the importance of early initiation of plasma exchange in atypical presentations of HUS. Methods: This study analyses all TPE sessions performed in aHUS paediatric patients. Multiple sessions(five to seven sessions) were performed with continuous flow cell separator TERUMOBCT Spectra Optia machine done on alternate days using FFP as replacement fluid. Pre and post procedural laboratory profiles were analysed to assess the response to TPE therapy. Patients were observed continuously for any adverse reactions. Results: A total of 12 sessions of TPE were performed. TPE was initiated within 3 days of onset of illness. An average volume of 2451ml was processed during each session. Following initiation of therapeutic plasma exchange, particularly after the 3rd session, the patient's haematological and renal parameters showed gradual and consistent improvement. Rise in haemoglobin and platelet counts, along with a steady decline in lactate dehydrogenase (LDH) levels, indicating resolution of haemolysis was seen. Renal function showed parallel improvement, with decreasing serum urea and creatinine levels and increasing urine output over the course of therapy. One patient experienced a transient hypotensive episode, managed conservatively. Conclusion: Atypical HUS can be effectively managed with therapeutic plasma exchange (TPE). In both patients, the timely use of TPE, alongside supportive therapy, contributed to significant clinical and renal recovery. These cases highlight the value of a multidisciplinary approach and early initiation of TPE as part of comprehensive care for children with atypical HUS.

PP 57

RED CELL ALLOIMMUNIZATION AND TRANSFUSION-TRANSMISSIBLE INFECTIONS IN BETA-THALASSEMIA MAJOR: A RETROSPECTIVE STUDY FROM A TERTIARY CARE CENTRE

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Background: including aims: Beta-thalassemia major is a transfusion-dependent condition where repeated red blood cell (RBC) transfusions are essential for survival. However, this life-saving therapy comes with risks, notably red cell alloimmunization and exposure to transfusion-transmissible infections (TTIs). The aim of this study was to determine the frequency and types of alloantibodies and TTIs in multitransfused beta-thalassemia major patients at a tertiary care centre in India. Methods: This retrospective observational study included 189 beta-thalassemia major patients undergoing regular transfusions. Demographic and clinical data were collected. Serological testing for alloantibodies was performed using antibody screening and identification panel. Screening for TTIs (HBsAg, anti-HCV, anti-HIV 1,2) was conducted using chemiluminescence immunoassay by Ortho Clinical Diagnostics and nucleic acid testing (NAT) using Roche, Cobas 5800. Statistical analysis included chi-square testing for association; p-value < 0.05 was considered statistically significant.

Results: The overall alloimmunization rate was 6.3% (12 out of 189 patients). The identified alloantibodies included Anti-c, Anti-C, Anti-cE, Anti-D, Anti-E, Anti-K, and Anti-Jka. Alloimmunization was significantly associated with the patient's sex (p = 0.024) and age at first transfusion (p = 0.015), with higher rates observed in females and those who began transfusions after the age of one year. The prevalence of transfusion-transmissible infections was 41.2% out of which hepatitis B was 1.05%,hepatitis C was 37% and HIV 1,2 was 3.17%, despite adherence to standard pre-transfusion testing protocols. This highlights the need for enhanced donor selection and more sensitive screening tools. Conclusions: Despite advancements in immunohematology and infectious screening protocols, beta-thalassemia major patients continue to face significant risks related to alloimmunization and TTIs. The study emphasizes the importance of early transfusion initiation, extended antigen matching, and strict adherence to advanced screening strategies to minimize these risks. Ensuring a safe and adequate blood supply remains crucial to improving the long-term outcomes of thalassemia care in India.

PP 58

INFORM, SUPPORT, PREVENT: DONOR NOTIFICATION AS A TOOL FOR TTI RISK REDUCTION

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Background: Aim and Background Donor notification and counselling are critical components of a safe and ethical blood transfusion system. This study highlights the need to strengthen donor followup to ensure timely communication and care. By improving response rates, we not only protect recipients but also empower donors with vital health information. Ultimately, a compassionate and well-informed approach benefits both individual and public health. Method This prospective study was conducted in the Department of Immunohematology and Blood Transfusion at Pt. B.D. Sharma Post Graduate Institute of Medical Sciences, Rohtak, over a period of two years, from January 1, 2023, to December 31, 2024. Total 81,909 donors were registered, 76,682 were found eligible. Each donor underwent medical screening, counselling, and TTI awareness. All collected units were tested for HIV, HBV, HCV, syphilis, and malaria using standard methods. All reactive donors were notified by post and telephonically three times with week interval. Result Among the 81,909 individuals who registered for blood donation, 76,682 were found eligible to donate. Out of these eligible donors, 2,475 (3.22%) tested reactive for transfusion-transmitted infection (TTI). Hepatitis C had the highest prevalence (1.28%), followed by Hepatitis B (1.03%), syphilis (0.58%), and HIV I & II (0.32%). The majority of reactive cases were reported in male donors, with the highest number observed in the 26–30 year age group. Approximately 84% of the reactive donors responded to notification and were counselled. Conclusion Our study highlights the importance of notification of reactive donors telephonically thrice on a weekly interval with a response rate of 83.51%. Notifying reactive donors is not just protocol—it's a chance to support, inform, and protect. Accurate contact details and compassionate counselling can turn silent risks into early interventions. Awareness, trust, and empathy must guide every step. After all, blood donation is not just a gift of life—it's a shared responsibility.

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KNOWLEDGE, ATTITUDES AND PRACTICES OF BLOOD DONATION AMONG SECOND-YEAR MEDICAL STUDENTS AT GMC, JAMMU.

Authors:

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Background: The blood transfusion services in India currently face a shortage of readily available, safe blood. Medical students represent a large, accessible pool of potential voluntary blood donors who can help bridge this gap. The proximity of blood centres to medical colleges significantly enhances the ease with which students can donate blood. If medical students can be effectively motivated to donate blood voluntarily, the burden on blood transfusion services could be significantly reduced. Thus the present study analysed the knowledge, attitudes, and practices regarding voluntary blood donation among 2nd year medical students at GMC, Jammu. METHODOLOGY: All the students present on the day of the survey who expressed their consent for participation were enrolled in the study. A 26-item self-administered questionnaire with four sections: demographics, knowledge, attitude, and practice, was used. The data were analysed using IBM-SPSS Statistics version 27. Data was presented using percentages and frequencies. RESULT: 126 students participated in the study, 39.6% males with mean age 20.74 ± 1.9 years and 59.4% females with mean age 20.25± 0.92 years. Overall 96.8 % knew about their blood groups. 87% of participants were aware that voluntary blood donation is the best type of donation. Only 43.2% were willing to donate blood voluntarily. Low haemoglobin in females (38.4%), students who never felt the need to donate (15.2%) and family pressure to not donate (12%) were the most common barriers to blood donation. Only 12% participants had donated blood. CONCLUSION: Though the participants of the study had a good knowledge of voluntary blood donation but efforts are needed to develop favourable attitude towards voluntary blood donation.

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EFFICACY OF ABD GROUPING PAD FOR NEONATAL BLOOD GROUPING

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Author Bio: ABSTRACT TITLE: Efficacy of ABD Grouping PAD for Neonatal Blood Grouping Tanveer Ahmed, Richa Gupta, Anshuja Singla, Mrinalini Kotru Department of Pathology, University College of Medical Sciences& GTB Hospital, Delhi-110095 **BACKGROUND:** Neonatal blood grouping is a critical component of early neonatal care. Conventional methods like Slide, Conventional Tube Technique (CTT), and Column Agglutination Test (CAT) are limited by factors such as low sensitivity, time consumption, requirement for expensive equipment, and need for larger blood volumes—challenges particularly significant in neonates. ABD pad is a new device that confirms ABD blood group in neonates by forward grouping, ready to use device and allow easy identification of the test and interpretation of findings. It offer rapid blood group determination using minimal blood volume without the need for specialized equipment or expertise. AIM: To evaluate the efficacy of the ABD grouping pad for neonatal blood grouping. OBJECTIVES: Primary objective: To determine the diagnostic accuracy of ABD grouping pad for neonatal blood grouping taking CTT as gold standard. Secondary Objective: To compare accuracy of ABD pad with CAT for ABD blood grouping in neonates METHODS: A cross-sectional study was conducted from April 2024 to August 2025 in the Department of Pathology (Regional Blood Transfusion Centre), at the University College of Medical Sciences and GTB Hospital, Delhi. A total of 598 neonatal samples received for blood grouping were tested using CTT (gold standard), CAT, and the ABD grouping pad. Samples were excluded if hemolysed, inadequate, DCT-positive, or if maternal Rh isoimmunization was present. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and diagnostic accuracy of the ABD pad were calculated against CTT. Cohen's Kappa was used to assess agreement. RESULTS: The ABD grouping pad demonstrated a sensitivity and specificity of 100%, with PPV and NPV also at 100%, indicating perfect diagnostic accuracy compared to the gold standard. Cohen's Kappa coefficient was 1.000 (p < 0.001), denoting near-perfect agreement with CTT. No discrepancies were observed between the ABD pad and the standard methods. CONCLUSION: ABD grouping pad is a highly accurate and reliable method for neonatal blood grouping, offering a practical alternative to conventional techniques, especially in low-resource settings. It simplifies the procedure, reduces turnaround time, and minimizes sample volume requirements, making it well-suited for neonatal use. Contact details: Email: pathologytanveer@gmail.com UCMS & GTB Hospital Delhi-110095 Phone no.: 8587865966

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AUTOIMMUNE HEMOLYTIC ANEMIA TRIGGERED BY NON-HODGKIN'S LYMPHOMA – A RARE ASSOCIATION

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Background: Autoimmune hemolytic anemia (AIHA) is a rare disorder where autoantibodies target red blood cells, leading to premature hemolysis. It can be classified as warm or cold AIHA based on antibody type and thermal activity. Secondary AIHA is frequently associated with lymphoproliferative diseases, particularly non-Hodgkin's lymphoma (NHL). The immune dysregulation in NHL can trigger autoantibody production. Early identification of AIHA in such cases is critical, as it may reflect underlying malignancy and influence both treatment strategy and prognosis. This case highlights the diagnostic and therapeutic challenges in managing AIHA secondary to NHL. b. Case report: A 72-year-old male presented with generalized weakness and decreased appetite for one month. Clinical examination revealed bilateral cervical lymphadenopathy. A routine blood grouping showed O RhD on forward amd agglutination in reverse O typing using EMT technology, suggesting a discrepancy. This was further evaluated using conventional tube testing at 24°C, 37°C, and 4°C. No agglutination was observed at 37°C, while 1+ agglutination were seen at 24°C and 4°C, raising suspicion of cold AIHA. Detailed clinical history and further investigations were initiated. Direct Antiglobulin Test (DAT) was positive for both IgG and C3d, while the Indirect Antiglobulin Test (IAT) was negative, confirming the presence of autoagglutinins. Concurrent malignancy screening and FNAC confirmed the diagnosis of non-Hodgkin's lymphoma. Further immunohematological workup, including heat elution and antibody identification, was planned but could not be completed due to patient's sample being unavailable as the patient succumbed to aspiration pneumonia before further evaluation could be done. c. Discussion: The blood grouping discrepancy—O RhD on forward grouping with temperature-dependent agglutination on reverse grouping—suggested the presence of cold-reactive antibodies, consistent with a Group IV ABO discrepancy. This, along with a positive Direct Antiglobulin Test (DAT) for IgG and C3d and a negative Indirect Antiglobulin Test (IAT), confirmed autoimmune hemolysis due to autoantibodies. The case was further complicated by systemic symptoms and lymphadenopathy, which led to the diagnosis of Non-Hodgkin's lymphoma, a known secondary cause of AIHA. Such discrepancies may be the first laboratory indication of an underlying lymphoproliferative disorder. Unfortunately, rapid clinical deterioration prevented further serologic characterization and intervention. d. Conclusions: This case highlights the diagnostic value of ABO discrepancies and DAT in identifying AIHA, particularly when secondary to malignancy like Non-Hodgkin's lymphoma. Early recognition and investigation of hemolysis can uncover underlying hematologic disease. However, timely diagnosis and intervention are critical, as rapid clinical decline may limit further management.

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FACILITATING THE UNRELATED DONOR STEM CELL HARVESTING IN INDIA THROUGH A HOSPITAL-STEM CELL REGISTRY COLLABORATION: AN EXPERIENCE FROM A TERTIARY CARE HOSPITAL IN NORTH INDIA

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Background: Hematopoietic stem cell transplant (HSCT) is a definitive cure for various hematological and non-hematological diseases. In India, significant proportion of the population requires HSCT but do not have a fully matched related family donor. This necessitates the need for matched unrelated donor transplants and their lookout in stem cell registries. Our hospital has been working in collaboration with DATRI, the largest blood stem cell registry in India, to carry out peripheral blood stem cell harvest from registered donors and has become the registered regional apheresis center of North India. Methods: This is a retrospective study carried out over a period of 16 months (March 2024 to June 2025) at a tertiary care hospital in North India. All procedures were performed on Spectra Optia Apheresis equipment. The donors pre-registered with DATRI, had undergone high resolution HLA typing (initial Typing) beforehand. When needed, DATRI would search in its database for a HLA matched donor and contact them. A confirmatory HLA typing was performed before initiating the procedure. The donor was brought to our hospital where he/she was explained about the procedure by our doctor and all their queries were answered, followed by detailed medical & physical examination, routine investigations like blood grouping, complete blood count, transfusion transmitted infection testing, liver & renal function test, coagulation profile, ultrasonography, chest x-ray etc to ensure their suitability for donation. Once cleared by the blood center head and a general physician, the donor was administered granulocyte colony stimulating factor injections daily for 5 days before the harvest. On the day of the harvest, a written informed consent was obtained from the donor. Peripheral cannulation was done by our team. The vitals were recorded all throughout. An intravenous calcium gluconate was also administered to manage citrate related hypocalcemia. A mid- procedure sample from product bag was sent to assess for CD34+ cell counts to determine the efficiency of the procedure and the estimated dose and duration for completion . A final product count was sent post completion and all reports were documented. Arrangements were made for secured air transfer of product in specialized temperature-controlled boxes to save time and maintain product quality. Measures were taken to maintain strict confidentiality by assigning specialized code to donor and patient and by keeping apheresis and transplant centers separate. Results: A total of 14 stem cell harvests were performed out of which 9 were ABO incompatible. The targeted dose of stem cells was achieved in all with a mean of 26.25 ±19.01x 106 CD34+ve cells/Kg weight of the recipient. All procedures were uneventful. After successful completion of the harvests, the donors were felicitated and encouraged to motivate others in their community to come forward for the same. Conclusion: With a dearth of mated donors, procuring stem cells from matched unrelated stem cell donor has proven to be a boon. This joint initiative of our hospital with DATRI is striving to increase awareness about unrelated stem cell donation amongst the general public and the life-changing impact it can have.

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"UNMASKING THE LINK": REDUCED D ANTIGEN REACTIVITY IN BLOOD GROUPING AND THE INFECTIOUS STATUS OF THE PATIENTS- A PROSPECTIVE OBSERVATIONAL STUDY

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Background: In forward blood grouping, red cells are tested for A, B, and D antigens using monoclonal antisera, with agglutination graded by antigen density. Some individuals show reduced D antigen expression, resulting in weaker anti-D reactivity. This often suggests a Variant D phenotype, which may be due to either a qualitative or quantitative defect in the D antigen itself. Causes other than the antigenic structure or gene to explain reduced D antigen reactivity have not been hypothesized and studied. The aim of the study is to evaluate the association between reduced D antigen reactivity and patient infectious status. METHODS: This was a prospective observational study conducted from October 2023 to March 2025 in a tertiary care centre. The study population comprised patient samples that demonstrated reduced RhD antigen reactivity, less than 3+ agglutination strength, when tested with anti-D antisera during forward blood grouping. A total of 53 such samples were identified. After the detection of reduced D antigen reactivity, Clinical and demographic data were retrieved from the Hospital's Information and Archival System (MIAS) portal. Following this, interdisciplinary discussions were held with the respective clinical departments, and blood cultures were sent for the patients. Results, including organism identification and CFU (colony-forming units) count, were recorded. Statistical evaluation was carried out using IBM SPSS Statistics, version 29, to evaluate the association. RESULTS: A total of 53 cases with reduced D antigen reactivity were identified during the study period. Remarkably, 29 (54.7%) of these 53 patients had positive blood cultures. Also, Elevated leukocyte counts were observed in all patients. Using the Wilson Score method, the 95% confidence interval for infection in this subgroup was 41.5% to 67.3%, confirming a significant infection rate. Escherichia coli is the predominant organism (72.4%) linked to altered antigenicity, followed by Staphylococcus aureus (13.8%). Further analysis revealed urinary tract infection (UTI) as the most frequent diagnosis among these 29 cases (17 cases), followed by respiratory tract infections (6 cases) and intra-abdominal infections (3 cases). Notably, 20 of these 53 patients were antenatal cases with a female predilection. To further validate our findings, repeat blood grouping testing was done in a subset of cases, demonstrating restoration of normal RhD antigen reactivity after the underlying infection had resolved. CONCLUSION: The findings suggest a link between reduced D antigen expression and systemic infections, especially UTIs. Certain bacteria, particularly E. coli, produce proteolytic enzymes (e.g., metalloproteases, serine proteases) that can cleave surface proteins on host cells. These enzymes may modify RhD proteins on red cell membranes and reducing their detectability during serological testing. This is similar to the Acquired B phenomenon. Blood grouping could serve as an early clue in detecting underlying infections.

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ABO BLOOD GROUP DISCREPANCIES IN BLOOD CENTER GMC JAMMU

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Background: ABO blood grouping is a cornerstone of pre-transfusion testing and plays a pivotal role in ensuring donor-recipient compatibility. Discrepancies in ABO grouping, if undetected, can result in severe and potentially fatal transfusion reactions. Study design: Observational Study Objectives: • To determine the frequency and nature of ABO blood group discrepancies in donor blood samples. • To emphasize the importance of resolving discrepancies to ensure accurate blood group assignment and transfusion safety. Materials and Methods: Eight donor blood samples exhibiting ABO grouping discrepancies were investigated at the Government Medical College (GMC) Blood Centre, Jammu. Forward and reverse blood grouping was carried out using the standard tube technique, Column Agglutination and SPRC fully automated technology with Anti-A, Anti-B, Anti-AB, A1 cells, A2 cells, B cells, and O cells. Additional investigations such as Rh typing, A1 lectin reactivity, anti-H testing, elution studies, and adsorption-elution techniques were employed where necessary to resolve the discrepancies. Outcome: During the study period, a total of 20,404 donations were recorded at GMC Jammu. Of these, 24.99% were blood group A, 31.66 were group B, 7.7% were group AB, and 33.42% were group O. Incidence of blood group discrepancies was 0.039% (8 samples). • subgroups of A, including Ay and weaker A were found in 5 /8 samples (62.5%). • A2B phenotypes exhibiting anti-A1 activity were identified in 2 /8 samples (25%). • A2 subgroup with naturally occurring anti-A1 antibody were in 2 /8 samples (25%). All discrepancies were successfully resolved using supplementary serological techniques, particularly A1 lectin testing and adsorption-elution methods. Conclusion: Although rare, ABO grouping discrepancies in donor samples can have critical clinical implications. Subgroups of A and A2B phenotypes were the predominant causes in our study.

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EVALUATING THE TRENDS AND CAUSES OF DONOR DEFERRAL AT BLOOD CENTRE OF A TERTIARY CARE HOSPITAL – A RETROSPECTIVE STUDY

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Background: Standardized pre-donation screening and testing procedures, which make the blood transfusion services safe, may lead to loss of potential donors due to deferrals. Although most deferrals are short-term and reversible, lack of follow-up leads to reduced donor return rate. Effective pre donation information, counselling and follow up will improve the donor return. This study aims to evaluate the trends and causes of blood donor deferral at Blood Centre of a tertiary care hospital. Methods: This was a retrospective, cross-sectional study, conducted at Blood Centre, Department of Immuno Haematology and Blood Transfusion, Tirunelveli Medical College Hospital by analysing donor registration and deferral records for six months period (December 2024 to May 2025) in the month of June 2025. Data were entered into a Microsoft Excel sheet and analyzed. Results: Among 6802 donors who registered during the study period, 93.2% (n=6339/6802) were males. The deferral rate among males was 20.4% (n=1294/6339), while it was 61.2% (n=283/462) in females and 100% (n=1/1) in transgender. 5224 donors had donated and the deferral rate was 23.2% (n=1578/6802). More deferrals (60.5%, n=954/1578) were in the 18-30 age group. 82.0% (n=1294/1578) of the deferrals were males. Most of the deferred donors were first time donors (61%, n=964/1578). B positive (35.6%, n=562/1578) and O positive (30.5%, n=482/1578) blood groups were common among deferrals. 98.4% (n=1553/1578) of the deferrals were temporary. Anaemia (17%, n=265/1553) and upper respiratory infections (15.4%, n=239/1553) were the common reasons for temporary deferrals. 1.6% (n=25/1578) of the deferrals were permanent. Epilepsy on treatment (24%, n=6/25), cardiac illness (20%, n=5/25) and psychiatric illness (20%, n=5/25) were the common reasons for permanent deferrals. Conclusion: Most of the donor deferrals in this study were temporary. Donors temporarily deferred due to inadequate sleep, alcohol intake, NSAIDs use, last donation <90days, on menstruation, fasting and Albendazole intake <7days will be eligible to donate in few days. Donors temporarily deferred due to antibiotic or antifungal use, wounds and injuries, skin allergy, vaccination, hypotension and dental procedures <14days will be eligible to donate in few weeks. Proper counselling regarding the reason behind those deferrals and clear communication regarding the date of eligibility to donate in future will improve the donor compliance. Tracking eligibility dates of deferred donors, personalised follow-up, reminders through SMS, email and phone calls can increase the deferred donor return rate and enhance the blood supply management.

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THE IMPACT OF PAIN SCALES AND TARGETED COUNSELLING ON BLOOD DONOR RETENTION: A RANDOMIZED CONTROL TRIAL

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Background: The Impact of Pain Scales and Targeted Counselling on Blood Donor Retention: A Randomized Control Trial Introduction: Voluntary non-remunerated blood donation (VNRBD) provides the basis for a safe and adequate supply of blood. First-time donor recruitment may be important but the focus on recruiting blood donors should shift toward the retention of donors in order to establish a stable blood supply. Pain, as well as anxiety in association with donation, are the most important negative aspects on motivation to repeat donations. Objective: 1) To evaluate the impact of pain scales on Blood donor retention. 2) To determine the effectiveness of targeted counselling in improving donor retention. Methods: A randomized control trial was performed at a tertiary care centre over three months (February 2025–April 2025) and included 208 voluntary male donors. Donors were divided into an intervention group, who were given targeted counselling (n=104) and a control group (n=104) who were given standard care by a systematic sampling. The Verbal Rating Scale and Faces Pain Scale were used to assess the subjects' severity of pain. Donor reactions were additionally measured with the Blood Donation Reactions Inventory (BDRI). The statistical analysis was performed with SPSS v21 (IBM, Chicago). Results: First-time donors in the control group reported higher pain levels (Verbal Rating: 32 moderate, 5 severe; Faces Scale: 24 rated "hurts even more") compared to the interventional group (20 moderate, 1 severe; 33 rated "hurts little bit"). Among repeat donors, the interventional group reported no severe pain, and 42 donors marked only "hurts little bit." Statistically significant differences were observed in pain perception between groups for both the Verbal Rating Scale ($p = 4.87 \times 10$) and the Faces Pain Scale ($p = 9.65 \times 10^{13}$). Conclusion: Pain during venipuncture is a frequently cited deterrent, even when objectively the pain may be mild. Pain perception is subjective and modifiable, but often neglected in blood donation protocols. The integration of pain scales with targeted counselling significantly improves donor comfort and satisfaction, subsequently enhancing the likelihood of repeat donations. Emotional reassurance and personalized support appear pivotal in shaping the donor's experience. It is recommended that blood banks adopt structured counselling interventions alongside routine pain assessments to promote long-term donor retention.

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CLINICAL TRIGGERS, INDICATIONS, AND UTILISATION PATTERNS OF FRESH FROZEN PLASMA IN CRITICALLY ILL PATIENTS: A RETROSPECTIVE OBSERVATIONAL STUDY

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Background: Fresh frozen plasma (FFP) is widely used to manage coagulopathy in critically ill patients. However, studies reveal frequent inappropriate use, particularly in non-bleeding individuals with mildly elevated INR. Evidence suggests limited efficacy of FFP in INR correction below 2.0 and its use carries risks like TRALI and volume overload. Guidelines from BCSH and AABB advocate restricted, evidence-based indications, yet compliance remains suboptimal across settings. In India, misuse persists due to clinical anxiety and medico legal concerns. This study evaluates FFP triggers and appropriateness in tertiary care context to guide rational transfusion practices. Aims and Objectives: To evaluate the clinical triggers, indications, and appropriateness of FFP transfusion in critically ill patients, and to analyze interdepartmental usage patterns to promote evidence-based, safe and rational transfusion practices. Materials and Methods: This retrospective observational study was conducted in the Department of Transfusion medicine at tertiary care teaching hospital over 3 months (December 2024-febrauary 2025). Data of 400 critically ill patients who received FFP transfusions were collected from transfusion records and clinical files. Parameters included patient demographics, department, indication for FFP transfusion, pre- and post-INR/PT values, number of FFP units transfused, bleeding status, and clinical outcomes. Appropriateness of transfusion was assessed using BCSH and AABB guidelines. Inclusion criteria: patients admitted to ICU or critical care units who received FFP during hospitalization. Availability of pre and post-FFP INR /PT values. Exclusion criteria: patients receiving plasma for therapeutic plasma exchange. Data was analyzed using descriptive statistics, paired t-tests, and ANOVA for interdepartmental comparisons. p- value <0.05 was considered statistically significant Results: A total of 1572 units of FFP were transfused across 400 critically ill patients. The majority of transfusions were in Cardiothoracic Surgery (32.6%), followed by Nephrology and Emergency Medicine (16.3% each). The most common clinical trigger was INR >1.5 without active bleeding (42%), followed by active bleeding (34%), pre-procedural correction (17%), and DIC (7%).INR significantly decreased from a mean of 2.5 ± 1.1 to 1.7 ± 0.8 post-transfusion ($p < 0.05$). Bleeding control was achieved in 80% of actively bleeding patients. However, 20% of FFP transfusions were deemed inappropriate per BCSH/AABB guidelines, especially in non-bleeding patients with mildly elevated INR. Best outcomes included effective INR correction and bleeding control during surgeries and invasive procedures, particularly in Cardiothoracic and Neurosurgical patients. Worst outcomes were noted in cases of refractory DIC, hepatic failure, and neurological deterioration, especially in Medical Gastroenterology and Oncology. Interdepartmental variation in usage patterns and appropriateness underscores the need for stricter guideline adherence and targeted education to reduce unwarranted transfusions and improve patient outcomes. Conclusion: This study highlights inappropriate FFP use in 20% of cases, mainly in non-bleeding patients with mildly elevated INR. Appropriate transfusions achieved significant INR reduction and bleeding control. Emphasizing guideline-driven use, ongoing clinician training, and regular transfusion audits is imperative to improve patient safety, optimize clinical outcomes, and uphold resource-efficient transfusion practices in critical care.

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CASE REPORT OF SUSPECTED ANTI-G ANTIBODY IN PREGNANT WOMEN CAUSING HDFN.

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Author Bio: POSTER PRESENTATION: ABSTRACT TITLE: Case Report of Suspected Anti-G antibody in pregnant women causing HDFN. DR. RIYAAN FIROJ, 2nd Year Resident Doctor, Department Of Immunohematology And Blood Transfusion, B.J.M.C. Ahmedabad, Gujarat, 380016. Mobile :7093195221 E-mail: riyaanfiroj45@gmail.com Co-Authors- Dr. Nidhi Bhatnagar, Dr. Mamta Shah, Dr. Sangeeta Shah, Dr. Kamini Gupta, Dr.Rahul. AIM: To evaluate importance of routine antibody screening in all pregnant women, especially those who are Rh (D) negative. Background: Anti-G is one of the cause of Hemolytic Disease of New born (HDN) antibodies. The sample was evaluated by fully automated cell screening & identification techniques along with Column agglutination technique. CASE DESCRIPTION: HDFN was diagnosed in the new born , We report a case where antenatal antibody screening revealed the presence of anti-E & anti-(D+C),anti-G & which where passively acquired from mother. Confirmation of alloimmunization was performed by adsorption & elution methods. MATERIALS & METHOD: Blood grouping & antibody screening were performed by automated Erythrocyte magnetized technology (EMT) by diagast followed by column agglutination technique (CAT) method. These antibodies were screened and identified by panel of 3 reagent cells & 11 reagent cells followed by adsorption and elution is performed by acid elution kit. Conclusion: The presence of anti-(D+C) & anti-G & anti-E antibodies in the serum of these patient highlights the need for careful monitoring during pregnancy.. The presence of anti-G along with other alloantibodies access the possibility of HDFN and need to be confirmed with adsorption and elution technique. The administration of anti-D immunoglobulin to Rh (D) negative women during delivery is an effective way to prevent HDFN . The reporting of these case highlights the importance of routine antibody screening in all pregnant women, especially those who are Rh (D) negative. References: 1. Allen Jr, Tippett . 2. Palli M, Gunnarsson C. 3. Schulze TL, Gogel M, Schabernig FA, Bugert P, Janetzko K. 4. Makroo R N, Kaul A, Bhatia A, Agrawal S, Singh C, & Karna P. (2015).

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PROGNOSIS OF PLASMAPHERESIS IN NEUROLOGICAL AND OTHER DISORDERS: EXPERIENCE FROM A TERTIARY CARE HOSPITAL IN GUJARAT.

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Author Bio: ORAL PAPER: ABSTRACT TITLE: Plasmapheresis in neurological and other disorders: Experience from a tertiary care hospital in Gujarat. DR. RIYAAN FIROJ, 2nd Year Resident Doctor, Department Of Immunohematology And Blood Transfusion, B.J.M.C. Ahmedabad, Gujarat, 380016. Mobile :7093195221 E-mail: riyaanfiroj45@gmail.com Co-Authors- Dr. Nidhi Bhatnagar, Dr. Mamta Shah, Dr. Sangeeta Shah, Dr. Kamini Gupta, Dr.Rahul. AIM: To Analyze the results of implementation of plasmapheresis in neurological disorders and other disorders performed in Dept of immunohaematology and blood transfusion. B.J. Medical college, Ahmedabad, Gujarat, India. Background: Plasmapheresis also known as a therapeutic plasma exchange (TPE) is extracorporeal procedure by which individual components of plasma that are harmful or blood cells are removed from organism by using a blood separation technology. Therapeutic plasma exchange (TPE) or plasmapheresis is treatment of choice in many neurological disorders and other disorders . Therapeutic plasma exchange it is safe experienced hands. MATERIALS & METHOD: Prospective review of PE procedures done during a period of 18 months from Jan 2025 to July 2026 in a tertiary care hospital in west India. Indications, clinical results and technical factors are discussed. Result: The main indication for PE was GBS (120 patients; 66.6%), Age of patients ranged from 8-65 years (mean = 45 years). The most common complication were uneasiness, allergy with urticaria, chills, thrombophlebitis, abdominal pain etc. There was no mortality. Conclusion: The analysis of 180 cases of PE done in our department shows that the procedure is safe, with only minimal procedure related complications and no mortality.

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WHEN ROUTINE TURNS RARE: A CASE OF ANTIBODIES DIRECTED AGAINST COMMERCIAL REAGENT RED CELL PRESERVATIVE

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Background: Commercial reagent red blood cells (RBCs) are essential for pre-transfusion antibody screening and identification, playing a critical role in ensuring transfusion safety. While typically inert, patient antibodies can, on rare occasions, develop against the preservatives present in these reagents rather than against red cell antigens. Such antibodies often mimic clinically significant alloantibodies or autoantibodies directed against high-frequency antigens leading to false-positive results. This results in unnecessary investigations, delays in pre-transfusion testing, and potential deferral of timely transfusion for patients. CASE REPORT A 51-year-old female, diagnosed with CA endometrium, presented with a baseline haemoglobin of 6.2 gm/dL, prompting a request for two units of packed red blood cells (PRBCs). Pre-transfusion testing commenced in the blood bank, utilizing DiaClon gel cards for ABO blood grouping. While the forward grouping identified the patient as AB positive, the reverse grouping unexpectedly yielded a 4+ reaction with both A and B reagent red cells, failing to complement the forward grouping. Further investigation through antibody screening using ID Dia Cell I-II-III revealed pan-reactivity, with all three screening cells exhibiting 4+ reactions. Notably, both the Autocontrol and Direct Antiglobulin Test (DAT) were clearly negative, ruling out autoantibodies or in vivo sensitization. Antibody identification, performed with ID Dia Panel, intensified the serological puzzle as all 11 panel cells showed a strong 4+ reactivity. Extended phenotyping, conducted using DiaClon Rh Subgroups + K cards, surprisingly yielded clear and unambiguous results, identifying the patient as C positive and e positive. Given the widespread reactivity, initial suspicion gravitated towards the presence of an alloantibody directed against a high-frequency antigen. To confirm this suspicion and secure compatible blood, 12 random O negative PRBC units were cross-matched using LISS COOMBS gel card(BIO-RAD). Unexpectedly, all 12 units were found to be compatible. This crucial finding shifted the focus, raising a strong suspicion of unexpected antibodies directed against a constituent or preservative present in the commercial red cell reagents, rather than against a red cell antigen. To substantiate our findings further, reverse grouping was repeated using in-house pooled A and B cells, and an Indirect Coombs Test (ICT) was performed using in-house pooled O cells. Both tests clearly yielded negative results, strongly favouring the presence of antibodies against reagent red cell constituent. This was further confirmed when antibody screening was performed again after meticulously washing the commercial reagent red cells with saline. This step resulted in a negative antibody screen, unequivocally confirming the presence of antibodies against a constituent or preservative in the reagent red cells, which could be effectively removed by saline washing. CONCLUSION This case highlights the critical importance of meticulous Immunohematological investigation when encountering perplexing pan-reactivity. It underscores that such patterns, initially suggesting alloantibodies to high-frequency antigens, can in rare instances be attributed to masked antibodies against reagent components, emphasizing the need for robust troubleshooting protocols to prevent unnecessary delays in patient care.

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ASSESSMENT OF REASONS FOR DEFERRALS IN BLOOD DONORS IN A TERTIARY CARE HOSPITAL IN NORTH INDIA.

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Author Bio: Assessment of Reasons for Deferrals in Blood Donors in a Tertiary Care Hospital in North India. Background The safety and success of blood donation rely heavily on the proper selection of suitable donors. Donor deferral plays a critical role in ensuring both donor and recipient safety by preventing individuals with underlying health issues or those on certain medications from donating blood. This process not only reduces the risk of transmitting infections through transfusion but also maintains the quality of the blood supply by ensuring that only healthy, suitable blood is collected. Furthermore, deferral criteria help protect vulnerable populations, such as immunocompromised patients, and support public health by preventing the transmission of diseases and promoting a safe and reliable blood supply. Understanding the common reasons for donor deferral can enhance knowledge of the donor population and inform more effective strategies for donor recruitment and screening. Methodology: This is an observational, retrospective study conducted at SMHS Hospital, a tertiary care hospital, viz SMHS in central Kashmir, throughout one and a half Years from January 2024 to June 2025.

The donor selection standard operating procedure (SOP) was followed; donors were subjected to a donor medical history questionnaire and a physical examination, including haemoglobin testing, before being declared fit for donation. If found unfit for donation, donors were deferred, and the data were recorded in the donor deferral register. Data from the donor registry, covering both in-hospital donations and outdoor camps, were analysed to assess patterns and reasons for deferral. Outcome: A total of 20,773 donors, comprising 3,860 voluntary and 16,913 replacement donors, were screened. The large majority of the donors, 20705 (99.67%), were Males, and the remaining 68(0.32%) were Females. Out of the 20,773 donors screened, 312 were deferred, resulting in a deferral rate of 1.5%, with 282 (90.38%) males and 30 (1.36%) females. Concerning the type of deferrals, 68 (21.8%) were permanent deferrals, all of them Males, and 244 (78.2%) temporary deferrals, consisting of 30 Females (12.3%) and 214 Males (87.7%). The most common causes of permanent deferral were Seizure disorder — 14 (20.58%), followed by Diseases of the Liver & Hepatitis infection, 11 (16.17%). Most common causes of temporary deferral were 'Short donor interval' — 57 (23.36%), followed by 'Polycythaemia' 46 (18.85%), all of them Males. Low haemoglobin being the third leading cause of temporary deferral — 21 cases (8.6%), all Females. Conclusion: Donor deferral is necessary to maintain the safety of both donors and recipients. It also improves the overall quality of the blood supply and safeguards vulnerable groups. A pattern and trend in donor deferral could be used as a reference for developing policy and future initiatives in donor education, encouragement and retention, ensuring a safer and more sustainable blood donation system.

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EFFICACY OF INTRADISCAL AUTOLOGOUS PLATELET-RICH PLASMA INJECTION IN CHRONIC LUMBAR DISC PROLAPSE

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Background: – Low back pain (LBP) is currently believed to be the leading cause of physical disability in the world. A handful of studies have been published pertaining to the use of PRP for the treatment of disc prolapse. This study was done to explore if an intradiscal injection of autologous PRP would be effective in reducing Lower Back Pain and improving functional activity in participants with lumbar disc protrusion or extrusion. METHODOLOGY – This study was a longitudinal, quantitative, quasi-experimental study with a non- equivalent Control Group Design. This study was conducted after approval from the Institutional Ethics Committee. Two study groups were involved in this study, Group A- Participants with lumbar disc protrusion or extrusion who were classified as non-responders to 3 weeks of physiotherapy by McKenzie protocol.

They underwent intradiscal autologous PRP injection in the involved disc. PRP was injected once in a single disc per participant. Group B- Participants with lumbar disc protrusion or extrusion who were classified as responders to 3 weeks of physiotherapy by McKenzie protocol. They were instructed to continue physiotherapy for a further 6 weeks. Participants were followed at 3 weeks and 6 weeks post-injection and were assessed by VAS (Visual Analogue Scale) and FRI (Functional Rating Index) scores. The comparison of categorical variables like Gender, Occupation, level of disc prolapse, and type of disc prolapse between the groups was done using the Chi- square/Fisher exact test. The comparison of the longitudinal change of VAS and FRI scores between groups was done using two-way Repeated Measures ANOVA. RESULTS – PRP Group had a mean age of 28.9 years (SD = 8.6), while the Physiotherapy Group had a mean age of 31.8 years (SD = 7.8), with a t-test P-value of 0.27 indicating no significant difference. Gender distribution was also similar. Clinical characteristics, such as the level (L3-L4, L4-L5, L5-S1) and type of disc prolapse, were also comparable. It was found that the mean VAS and FRI scores decreased over time in both the PRP group and the Physiotherapy group indicating that both treatment modalities are reducing pain and improving functional outcome in the participants. With regards to the VAS score, the PRP group experienced a mean reduction of 2.32 points after 3 weeks and 2.95 points after 6 weeks. The Physiotherapy Group experienced a mean reduction of 0.81 points after 3 weeks and 1.03 points after 6 weeks ($P<0.05$). This indicates PRP group showed a significantly greater decrease in pain compared to the Physiotherapy group. With regards to the FRI score, the PRP Group experienced a mean decrease of 19.12 points after 3 weeks and 24.71 points after 6 weeks. The physiotherapy Group experienced a mean decrease of 6.70 points after 3 weeks and 9.66 points after 6 weeks($P<0.05$). This indicates PRP group showed a significantly greater improvement in functional outcome compared to the Physiotherapy group CONCLUSION - The current study's findings suggest that intradiscal autologous PRP injection was more effective than Physiotherapy in reducing pain and improving function over time.

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LOW FREQUENCY IRON SUPPLEMENTATION IN REGULAR REPEAT WHOLE BLOOD DONORS WITH LATENT IRON DEFICIENCY

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Author Bio: Title: Low frequency Iron supplementation in regular repeat whole blood donors with Latent Iron Deficiency Authors: Haramol Kaur, Richa Gupta, Surender Vats Institute: Department of Pathology at University College of Medical Sciences and GTB Hospital, Delhi. Background: A voluntary regular repeat whole blood donor is one who has donated at least three times, the last donation being within the previous year, and continues to donate regularly at least once per year. Regular whole blood donors are at increased risk of Iron shortage after donation (230 mg of Iron loss per donation). As per Indian guidelines, pre-donation Hemoglobin (Hb) screening is the main strategy to evaluate donor Iron status and eligibility for blood donation (cut off Hb 12.5 g%). But Hb levels at the time of screening fail to detect Latent Iron Deficiency (LID). Reduced Iron levels can have impact on quality of life and also makes the donor prone to develop overt Iron deficiency anaemia. Iron supplementation in these individuals can prevent these side effects and also maintain them in donor pool. Low frequency Iron supplementation was given, which is defined as elemental Iron 60 mg taken thrice a week for a period of 90 days Aim: To evaluate the effect of low frequency Iron supplementation on correction of Latent Iron Deficiency in regular repeat whole blood donors Methodology: This is a Prospective cross sectional study which was conducted amongst regular repeat whole blood donors coming for donation at camps organised by RBTC, GTB hospital. A sample size of minimum 23 subjects were taken. EDTA and plain blood samples collected from the bag tubing at the time of blood donation for blood grouping and routine serological testing were utilised for : 1. CBC - by fully automated five part hematology analyser 2. Serum Ferritin – by Chemiluminescence immunoassay analyser Following low frequency Iron supplementation for 90 days, repeat samples were collected, one in EDTA and one in plain vial (3 ml each) collected from antecubital vein under aseptic precautions were taken after 90 days of Iron supplementation for same tests. Outcome: Among 400 screened donors, 27.5% had latent iron deficiency. Of those, 60 initiated low-frequency iron supplementation; 26 completed follow-up, with 92.3% achieving ferritin normalization. Despite moderate adherence, the intervention showed high efficacy, indicating that low-frequency iron supplementation effectively corrects latent iron deficiency in regular repeat whole blood donors. Conclusion: Low-frequency iron supplementation significantly corrected latent iron deficiency in regular repeat blood donors with high efficacy and tolerability, suggesting its potential integration into donor care protocols for improving health and retention. Presenter: Dr. Haramol Kaur PGY2, Pathology dept. UCMS & GTB Hospital New Delhi, 110095 7986969329 dr.haramolkaur09@gmail.com

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CLASSICAL PNH WITH MAJOR ABO-INCOMPATIBLE STEM CELL TRANSPLANT: A CASE OF DELAYED ENGRAFTMENT MANAGED WITH THERAPEUTIC PLASMA EXCHANGE AND BORTEZOMIB

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Background: Paroxysmal Nocturnal Hemoglobinuria (PNH) is a rare, life-threatening hematologic disorder characterized by hemolysis, bone marrow failure, and thrombosis. Allogeneic stem cell transplantation (allo-SCT) remains the only curative option in resource-limited settings where complement inhibitors like eculizumab are unavailable. Case Presentation: We report the case of a 31-year-old male diagnosed with classical PNH in June 2023, based on anemia, indirect hyperbilirubinemia, and high-sensitivity flow cytometry showing significant PNH clones in monocytes (97%) and neutrophils (98.9%). He was initially managed with Danazol and aspirin. In February 2024, he developed bi-cytopenia requiring transfusions. Due to lack of access to eculizumab and worsening cytopenias, a matched family donor peripheral blood stem cell (PBSC) transplant was planned. The patient's mother was a 10/10 HLA match but had a major ABO incompatibility (donor: B Rh D positive; recipient: O Rh D positive) with a pre-transplant anti-B titre of 512. Pre-transplant desensitization included two sessions of therapeutic plasma exchange (TPE) and one dose of Rituximab 500 mg. Conditioning was done using Fludarabine, Treosulfan, and ATG. PBSC harvest yielded 7.5 million CD34+ cells/kg. Post-transplant, delayed engraftment was noted (ANC >500 by day 19; platelets >20,000/µL by day 22). Subsequently, the patient developed delayed red cell engraftment and red cell transfusion dependence, on further investigations, viral markers including parvo virus was negative and Bone marrow study was suggestive of pure red cell aplasia (PRCA), with high anti-B titres of 1024. The patient underwent two additional TPE sessions and was started on Bortezomib to suppress residual alloantibody production. Anti-B titres declined to 8 over 20 days. By day 80, mini-transplant panel was negative, Red cells engraftment was noted on day 101, and by day 118, the patient's blood group converted to donor type. At one-year follow-up, the patient remains clinically stable and transfusion-independent. Conclusion: This case highlights the challenges and successful management of major ABO-incompatible allo-SCT in PNH, with delayed red cell engraftment managed effectively using a combination of TPE and Bortezomib. Early identification and intervention in PRCA can improve post-transplant outcomes in resource-constrained settings.

PP 75

UTILITY OF WASHED, IRRADIATED , HPA-MATCHED PLATELET TRANSFUSIONS IN THE MANAGEMENT OF SEVERE FNAIT IN A TERTIARY CARE CENTRE IN SOUTHERN INDIA

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Background: Fetal and Neonatal Alloimmune Thrombocytopenia (FNAIT) is a potentially life-threatening condition resulting from maternal alloimmunization against fetal platelet-specific antigens, most commonly Human Platelet Antigen-1a (HPA-1a). Affected neonates are at risk of severe thrombocytopenia, intracranial hemorrhage, and other bleeding manifestations. Timely and appropriate transfusion support is critical in managing these cases. The use of washed, irradiated, HPA-matched platelet transfusions is considered the gold standard in severe FNAIT but remains underutilized in many settings due to logistical and technical challenges. Objectives: To assess the efficacy and feasibility of washed , irradiated HPA-matched platelet transfusionsin neonates with severe FNAIT in a tertiary care centre in Southern India. Methods: A retrospective analysis was conducted over a five-year period (2018–2023) in the Department of Transfusion Medicine at a tertiary care center. Neonates diagnosed with FNAIT based on clinical presentation, maternal anti-HPA antibody screening, and exclusion of other causes of thrombocytopenia were included. Patients receiving washed, irradiated, HPA-matched platelets were assessed for post-transfusion platelet increment, bleeding resolution, and adverse transfusion reactions. Where HPA-matched units were unavailable, standard random donor platelets were used, and outcomes were compared. Outcomes : Among 18 neonates diagnosed with severe FNAIT, 12 received HPA-matched, washed, irradiated platelet transfusions. These neonates demonstrated a mean corrected count increment (CCI) of 8,000–12,000/µL at 1 hour and sustained increments over 24–48 hours. Clinical bleeding resolved in over 90% of cases post-transfusion, with no significant transfusion-related complications observed. In contrast, the 6 neonates who received standard random donor platelets showed suboptimal platelet increment and required multiple transfusions. One case of intracranial hemorrhage occurred in this group. Conclusion: Washed, irradiated, HPA-matched platelet transfusions significantly improve platelet recovery and clinical outcomes in neonates with severe FNAIT, compared to non-matched platelet transfusions. Their use should be encouraged, especially in high-risk pregnancies with known maternal alloimmunization. Early antenatal identification of at-risk pregnancies and the establishment of regional HPA-typed platelet donor registries can enhance preparedness and optimize neonatal care. With appropriate planning and coordination, even resource-constrained settings can adopt this transfusion strategy effectively. Keywords: FNAIT, alloimmune thrombocytopenia, HPA-matched platelets, neonatal transfusion, washed platelets, irradiated platelets, transfusion medicine.

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INFLUENCE OF BLOOD TRANSFUSION DURING INDUCTION CHEMOTHERAPY ON TREATMENT OUTCOMES IN ACUTE MYELOID LEUKEMIA IN A TERTIARY CARE CENTRE IN SALEM DISTRICT

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Background: Acute Myeloid Leukaemia (AML) is an aggressive hematological malignancy characterized by clonal proliferation of immature myeloid cells, resulting in bone marrow failure. Induction chemotherapy is the cornerstone of initial treatment, aiming to achieve complete remission. However, intensive chemotherapy induces profound cytopenias, necessitating supportive care in the form of red blood cell (RBC) and platelet transfusions. While transfusions are lifesaving, they carry potential risks, including transfusion-related immunomodulation (TRIM), iron overload, increased susceptibility to infections, and possible long-term impacts on survival. Despite widespread transfusion use during AML induction therapy, data regarding the influence of transfusion volume on clinical outcomes remain limited and inconclusive. Objective: This study aims to evaluate the influence of blood transfusion burden during induction chemotherapy on treatment outcomes in newly diagnosed AML patients. Key outcomes include remission rates, infection profiles, transfusion-related complications, early mortality, and overall survival. Methodology: A retrospective observational study was conducted at Vinayaka Mission's Kirupananda Variyar Medical College and Hospitals (VMKVMCH), Salem, including patients diagnosed with AML from March 3, 2025, to June 3, 2025. All patients received standard induction chemotherapy (7+3 regimen or equivalent). Data collected included patient demographics, baseline clinical parameters, transfusion records (total RBC and platelet units transfused), duration of neutropenia, occurrence of infections, transfusion reactions, remission status post-induction, early mortality, and survival data. Patients were stratified into low and high transfusion requirement groups to examine associations between transfusion volume and clinical outcomes. Statistical analyses involved chi-square tests for categorical variables, Kaplan-Meier survival analysis, and multivariate Cox regression modeling to control for potential confounders such as age, cytogenetic risk, and disease burden. Outcome: Preliminary findings indicate that patients receiving higher volumes of RBC transfusions during induction showed a trend toward increased infection rates and longer hospital stays. However, no statistically significant difference was observed in complete remission rates between the low and high transfusion groups. Platelet transfusion frequency was not directly associated with remission outcomes but appeared to correlate with prolonged thrombocytopenia in certain cases. Ongoing multivariate analysis will further elucidate the independent effect of transfusion burden on overall survival. Conclusion: Transfusion support is integral to AML induction therapy; however, the cumulative transfusion load may influence treatment-related complications, particularly infection risk and recovery timelines. The findings underscore the importance of balanced transfusion practices that provide necessary supportive care while minimizing potential adverse effects. Further prospective studies are needed to refine transfusion thresholds and optimize supportive care protocols in AML treatment. Keywords: Acute Myeloid Leukaemia, Blood Transfusion, Induction Chemotherapy, Treatment Outcomes, Transfusion Burden, Supportive Care, VMKVMCH Salem

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AI FOR FNAIT: ENHANCING PREDICTION AND PERSONALIZING CARE

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Background: Fetal and Neonatal Alloimmune Thrombocytopenia (FNAIT) presents a tough challenge in newborn care, often leading to critically low platelet counts. The biggest fear for these babies? A significant risk of intracranial hemorrhage (ICH), a brain bleed that can cause lasting neurological problems or even be fatal. Our current methods for predicting how severe FNAIT will be and figuring out the best treatment aren't precise enough. We often rely on things like a mother's antibody levels and the baby's genetic makeup, but these don't always give us the full picture, leading to treatments that might not be perfectly tailored. Objective: This abstract explores how Artificial Intelligence (AI) and Machine Learning (ML) can truly change FNAIT management. Our main goal is to vastly improve our ability to predict FNAIT severity, especially the risk of that dangerous brain bleed, and to create personalized treatment plans. We're aiming to develop smarter predictive models that go beyond what we can do now, ultimately leading to better outcomes for these fragile patients and reducing the serious complications of FNAIT. Methods: We're proposing a comprehensive AI/ML framework. This involves gathering a rich collection of patient data: demographics, detailed medical history, in-depth immune system information (like antibody levels, their specific types, how strongly they bind, their sugar patterns, and certain immune receptor variations), and genetic details from both parents and the baby. Gathering enough high-quality, standardized data will be key, so multi-center collaborations are vital. We'll then carefully prepare this data and use various sophisticated ML algorithms (like Random Forests, Gradient Boosting Machines, and even Deep Learning for analyzing medical images) to predict things like disease severity, the lowest a baby's platelet count might drop, and how well they'll respond to treatment. We'll rigorously test these models using statistical measures and, importantly, assess their practical use in the clinic. We'll also use "Explainable AI" techniques to ensure doctors can understand how the AI reaches its conclusions. Results: While this abstract lays out our proposed approach, the power of AI/ML strongly suggests a promising future. We fully expect to develop models that can provide individualized ICH risk scores, accurately predict a baby's platelet nadir, and help guide the ideal timing and dosage for prenatal treatments like IVIG, as well as postnatal care. These models should offer a level of precision that's currently out of reach, allowing us to move from generalized treatment strategies to ones truly customized for each patient facing this rare but critical condition. Conclusion: AI and Machine Learning offer an incredible opportunity to completely transform FNAIT management. By providing super-precise predictions of disease severity and enabling personalized treatments, these technologies can make a real difference. For this to succeed, we'll need global data sharing, strong teamwork among experts from different medical fields, thorough testing in real-world clinical settings, and clear ethical guidelines. As AI and ML continue to advance, they are set to play a crucial role in reducing illness and death from FNAIT, promising a brighter outlook for affected families.

PP 78

NAVIGATING ALLOIMMUNIZATION IN A CASE OF DELTA BETA THALASSEMIA: A TRANSFUSION CHALLENGE

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Background: Delta beta (δβ) thalassemia is a rare variant of thalassemia characterized by elevated levels of fetal hemoglobin (HbF)beyond infancy due to reduced synthesis of both δ and β-globin chains—typically due to gene deletions. Usually δβ-thalassemia presents mild anemia. Reports of δβ-thalassemia from India are scarce in the indexed English literature. The patient also had the rare R2R2 phenotype whose frequency ranges as low as 0.5-1.1% in the Indian subcontinent and multiple alloantibodies, including anti-e, which further complicated crossmatching and transfusion. CASE PRESENTATION A twelve-year old female child was evaluated for easy fatiguability and generalized weakness for past 1 month. Hematological investigations revealed severe anemia. Peripheral blood smear exhibited severe microcytic hypochromic anemia with thrombocytopenia & 1.5% reticulocytes. Anisocytosis and poikilocytosis of red cells were also observed. Iron studies showed reduced serum Iron, serum ferritin and transferrin saturation with increased Total iron binding capacity (TIBC) suggestive of severe iron deficiency anemia. Comprehensive analysis of hemoglobin by high performance liquid chromatography (HPLC) showed HbF constituting 97.2%, 1% HbA2 and 0.4 % HbA. Hemoglobin analysis of both parents showed elevated levels of HbF, mother's HbF being 18.7% and father's 27.7% suggesting homozygous δβ-thalassemia in daughter. Demand for two units of PRBC was received at blood centre. Patient typed as O Rh D positive with the rare R2R2 phenotype (cDE/cDE): C- E+ c+ e- K-. The cross match performed by column agglutination technique (CAT) was 4+ positive. IHL work up revealed a positive ICT of 4+ & DCT positivity of 3+. Antibody identification showed the possibility of Anti-e, Anti- C, Anti-K, +/- Anti – Jka/Jkb. 118 units of O Rh D positive were phenotyped and 3 units of the above Rh phenotype (e Negative) were found. Since no compatible unit was available the same was issued as "Best match" packed cell in view of severe anemia in patient. Patient was premedicated with steroids before transfusion however the patient developed hematuria two hours post transfusion and was managed conservatively. Post transfusion workup was same as pre transfusion workup. There was a rise in hemoglobin from 3.5 to 4.2gm/dl post transfusion. Patient was started on iron therapy (Injection FCM) which gradually increased her hemoglobin levels. Following clinical improvement, the patient was subsequently discharged. CONCLUSION δβ -thalassemia is an uncommon cause of markedly elevated fetal hemoglobin beyond fetal period. Clinical and haematological parameters should be evaluated to render an accurate diagnosis. Our case was a rare case with much higher HbF levels and severe anaemia. Case was further complexed due to the rare R2R2 phenotype and due to alloimmunization with multiple alloantibodies. It was a challenging task for the blood center to issue even a single unit of compatible blood. The case highlights the need for national/zonal database of rare phenotype blood donors to timely fulfil the blood requirement of patients in need. KEY WORDS Delta-Beta Thalassemia; Homozygote; Alloimmunization; R2R2 phenotype.

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Establishment and performance assessment of the preparation method of internal quality control sample for the Transfusion-Transmitted Infection Laboratory

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Background: including aims: Internal Quality Control (IQC) is essential to ensure the accuracy and consistency of serological testing in Transfusion-Transmitted Infection (TTI) laboratories. This study focuses on developing an In-house control & method for internal control sample preparation and evaluating their performance at different storage and thawing temperatures throughout study period. Materials and Methods: For the study, IQC was made identifying reactive units each for hepatitis B virus(HBV), hepatitis C virus(HCV), and human immunodeficiency virus(HIV), and controls were prepared for the three viral markers. Each reactive unit plasma was tested for the E ratio, and doubling dilution was done using non-reactive AB plasma to achieve an E ratio of 2.0-3.0 as per the SOP. Then plasma was converted to serum using a recalcifying solution. Prepared 1 ml aliquots of all internal controls were stored at two different temperatures −40 °C and −80 °C. Prior to routine use, each aliquot was thawed at two different temperatures room temperature (RT) and 37 °C using a plasma thawer and each aliquots was subjected for test was run over the period of 5 days . These IQC aliquots were further stored at 4°C for their routine use with each test run for next 25 episodes. Results : Mean of E ratio aliquot stored at -40°C and -80°C, thawed at RT and 37°C for HBV was 2.35 (range 1.99 to 2.71) , HCV mean was 2.00 (range 1.46 to 2.54), and for HIV mean was 2.88 (range 2.25 to 3.51). The result of aliquots stored at -40°C & -80 °C showed consistent and reproducible results and no statistical significant difference noticed in E ratio value between the result of aliquot stored at -40°C thawed at RT and 37°C to that of aliquots stored at -80°C thawed at RT and 37°C .E-ratio values for HBV, HCV, and HIV remained within ±3SD and -3SD on the Levey-Jennings chart, indicating acceptable performance . Overall, the IQC materials were suitable for use in routine quality monitoring in TTI laboratory. Conclusions: It was observed that the serum form of HIV IQC aliquots were not giving reproducible results (E ratio) while this issues was resolves when plasma form was subjected for testing. Therefore, it is recommended to use plasma form of IQC for HIV over to serum. Either of the two storage temperatures (−40 °C and −80 °C) was suitable for IQC aliquots, and both thawing temperatures (room temperature and 37 °C) demonstrated acceptable performance. Their implementation can significantly strengthen internal quality assurance, thereby enhancing blood safety and reliability of transfusion services. Keywords: internal quality control, HIV, HBV, HCV, transfusion transmitted infection.

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ANALYSIS OF KEY PERFORMANCE INDICATORS OF THE BLOOD CENTRE OF A TERTIARY CARE REFERRAL TEACHING HOSPITAL IN SOUTH INDIA

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Background: Blood transfusion services play a crucial role in patient health care management. The quality of blood and blood components as well as their injudicious use may affect the health care facility. This can be achieved through the implementation of a Quality Management System (QMS), which is effectively monitored using Key Performance Indicators (KPIs). The present study aimed to assess the quality performance of the blood centre by analyzing various KPIs. Methods: This cross-sectional analytical study was carried out from November 2023 to May 2024 and September 2024 to January 2025. Data were collected systematically, and Root Cause Analysis (RCA) was carried out for any deviations. Appropriate Corrective and Preventive Actions (CAPA) were implemented. The variables required for KPI calculations were extracted from various registers maintained at the blood centre. Results: The observed KPIs during the study period were as follows: Donor Deferral Rate- 11.03%, Adverse Donor Reaction Rate-0.128%, Percentage of components prepared-98.25%, Seroreactivity of donors-1.24%, Turnaround Time for elective and emergency cases-40.73 minutes and 7.27 minutes. The Quality control failure rates were zero, adverse transfusion reaction rate-0.024%, wastage rate of components-1.21%, percentage of outdated units-0.44%; these were within the National Accreditation Board for Hospitals & Healthcare Providers (NABH) benchmark. Seroreactivity of Syphilis-0.33%, percentage of component usage-99.3%, percentage of wastage of whole blood at blood centre- 5.29% were did not meet the bench mark. Conclusion: While most KPIs met NABH standards, elevated syphilis seroreactivity, suboptimal component usage, and whole blood wastage require attention. These can be addressed by strengthening pre-donation screening—especially for syphilis, ensuring uniform implementation of national transfusion policies to promote 100% component usage, and enhancing staff training to reduce under-collection, which was a significant cause of blood wastage in this study.

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SEROPREVALENCE OF BLOOD-BORNE INFECTIONS AMONG TATTOOED VERSUS NON-TATTOOED BLOOD DONORS: A COMPARATIVE CROSS-SECTIONAL STUDY

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Author Bio: Background Safe blood transfusion is a cornerstone of modern healthcare. Transfusion-transmissible infections (TTIs), such as Hepatitis B virus (HBV), Hepatitis C virus (HCV), Human Immunodeficiency Virus (HIV), and Syphilis, pose continuous threats to blood safety. Tattooing, especially when done in unregulated settings, has been recognized as a potential risk factor for blood-borne infections (BBIs). With the increasing popularity of tattoos, evaluating their impact on blood donor safety is crucial. This study aimed to assess and compare the seroprevalence of BBIs among tattooed and non-tattooed voluntary blood donors. Objectives - To determine the seroprevalence of HBV, HCV, HIV, and Syphilis among tattooed blood donors. - To compare infection rates between tattooed and non-tattooed donors. - To identify tattoo-related risk factors contributing to increased seropositivity. Methods A comparative cross-sectional study was conducted over 7 months from 1/1/2025 to 30/07/2025 at the blood bank of Vinayaka Mission's Kirupananda Variyar Medical College and Hospital, Salem, Tamil Nadu. A total of 600 voluntary blood donors were included: tattooed donors (n=120) and non-tattooed donors (n=480). All donors were screened for HBV (HBsAg), HCV (Anti-HCV), HIV (4th generation ELISA), and Syphilis (VDRL/RPR). A structured questionnaire captured demographic details and tattoo-related history, including the number of tattoos, the setting (licensed or unlicensed tattoo parlor), and time since the last tattoo. Data analysis was performed using SPSS Version 25. Chi-square test and logistic regression determined statistical significance and odds ratios. Results The overall seroprevalence of BBIs in tattooed donors was 3.75%, significantly higher than the 1.68% in non-tattooed donors ($p<0.01$). Among tattooed donors, infection rates were: HBV (1.5%), HCV (1.2%), HIV (0.7%), and Syphilis (0.35%). In non-tattooed donors: HBV (0.7%), HCV (0.5%), HIV (0.3%), and Syphilis (0.18%). Tattooed donors had a 2.3-fold increased risk of seropositivity for any BBI (OR=2.32, 95% CI: 1.65–3.27). Higher risks were observed among donors with multiple tattoos, tattoos from unlicensed establishments, and recent tattoos (within the past 12 months). Conclusions Tattooing is associated with a higher risk of blood-borne infections among blood donors. While tattoos are not an absolute contraindication for donation, careful screening and deferral of recently tattooed individuals are recommended to maintain transfusion safety. Public health strategies should focus on promoting safe tattooing practices, regulating tattoo parlors, and raising awareness about BBIs. Keywords Tattoo, Blood donation, Seroprevalence, Blood-borne infections, Transfusion safety, HBV, HCV, HIV, Syphilis.

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THERAPEUTIC PLASMA EXCHANGE IN ALCOHOL-INDUCED ACUTE-ON-CHRONIC LIVER FAILURE: A GAME-CHANGER IN BRIDGING THERAPY (A CASE SERIES)

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Background: Acute-on-chronic liver failure (ACLF) is defined as an acute deterioration in patients with pre-existing chronic liver disease, usually triggered by a precipitating event, leading to failure of one or more extra-hepatic or hepatic organ systems, and associated with high short-term mortality. Liver transplantation though a definitive treatment; is not always feasible due to limited donor availability or patient instability. Therapeutic plasma exchange (TPE) is an emerging extracorporeal treatment modality that works by removing circulating inflammatory mediators, toxins, and bilirubin, thereby potentially modulating the immune response and stabilizing hepatic and extrahepatic functions. According to the 2023 guidelines by the American Society for Apheresis (ASFA), high-volume TPE for ACLF is classified as Category I with Grade 1A recommendation, suggesting strong evidence for its use. In contrast, standard-volume TPE is categorized as Category III with a Grade 2B recommendation, indicating that its role is less well established and should be considered on a case-by-case basis. At our institution, standard-volume TPE is routinely used in the management of ACLF. Aims: To assess the efficacy and safety of therapeutic plasma exchange in alcohol-induced ACLF, and its impact on biochemical parameters and short-term survival alongside standard medical therapy. Methods: Retrospective analysis of patients diagnosed with alcohol induced ACLF managed with TPE along with medical therapy in our institution from August 2023 to July 2025 was done. Results: Five male patients (aged 20–50 years) in whom TPE was done were included. Based on EASL-CLIF criteria, three had Grade I and two had Grade II ACLF.

All presented with jaundice, coagulopathy, and renal dysfunction; one also had hepatic encephalopathy. Each received 1–3 standard-volume TPE sessions (1–1.5 plasma volumes/session) on alternate days. Replacement fluid included 5% albumin and fresh frozen plasma, tailored based on coagulopathy. Concurrent Standard Medical Therapy included antibiotics, lactulose, albumin, nutritional support, and renal monitoring. Key biochemical parameters—including serum bilirubin, INR, serum creatinine, and encephalopathy grade—were recorded before and after TPE. Post-procedure, serum bilirubin decreased from 30.92 ± 17.08 to 19.93 ± 15.15 mg/dL, INR improved from 2.18 ± 0.53 to 1.78 ± 1.11, and creatinine showed a mild decrease. One patient showed clinical improvement in hepatic encephalopathy. Four of the five patients survived the 28-day follow-up, while one died of multiorgan failure. TPE was well tolerated overall, with only minor side effects such as chills noted in two cases. Conclusion: Standard-volume TPE, when used alongside medical therapy, appears to be a safe and potentially effective adjunctive treatment in alcohol-induced ACLF. This case series suggests improvements in liver function, coagulation profile, and encephalopathy. These findings support TPE as a bridging therapy to recovery or transplantation. Larger randomized controlled trials are needed to validate these observations and define optimal treatment protocols.

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AN OBSERVATIONAL STUDY ON BLOOD GROUP DISCREPANCIES DUE TO WRONG BLOOD IN TUBE (WBIT) AT SVIMS BLOOD CENTRE, TIRUPATI, ANDHRA PRADESH, SOUTH INDIA.

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Background: Pretransfusion testing has undergone many remarkable changes over the past few decades ranging from manual methods to semi-automation and fully automation. But the sample collection from the correct patient has been a challenge in almost every hospital. Although methods such as positive patient identification and use of Radio Frequency Identification (RFID) technology can significantly reduce the incidence of Wrong Blood In Tube (WBIT), these implementations may not be feasible in all health care settings due to resource constraints, infrastructural limitations and training requirements. By observing the incidence of WBIT, we aimed to re-emphasize the introduction of Two Sample Policy in our institute using two different samples, one received for Blood grouping and typing and the other received for cross matching at the time of submission of request for Blood and its components. Methods: This is a retrospective study extending over a period of 2.5 years (January 2023 to June 2025) at a tertiary care hospital Blood centre in south India. After sensitizing the clinicians during Hospital Blood Transfusion Committee meetings and the implementation of two sample policy in the institute, the retrospective data collection was done. As per the two sample policy, two samples of the same person would be collected one during the time of blood grouping and typing and the second one at the time of submission of request for blood and blood components. In case of any discrepancy between the two samples then the incident will be recorded and the discrepancy will be resolved as per Standard Operating Procedure. Results: A total of 38,471 requests were received from various departments for blood and blood components during the above study period. From these 38,471 requests, a total of 52,399 blood and blood components were issued which include 21,560 (41.1%) were packed red blood cell units (PRBC). A total of 26 (0.12%) WBIT errors were recorded as grouping discrepancy between the sample received for blood grouping and typing and the one received at the time of submission of request for blood and blood components. Notably all 26(0.12%) grouping discrepancies were for the request of PRBC. Conclusion: The increase in incidence of WBIT errors in our institute may reflect the deficiency in adequately trained personnel for proper patient identification during phlebotomy, sample labelling and blood collection. Staff involved in these activities should be regularly trained regarding positive patient identification protocols. Additionally, where ever feasible implementation of RFID can significantly reduce the incidence of WBIT errors by enhancing the accuracy and traceability in the pre analytical phase and thereby can improve the transfusion safety.

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ACROSS THE SPECTRUM : THE ROLE OF THERAPEUTIC PLASMA EXCHANGE IN DIVERSE DISORDERS

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Background: Therapeutic plasma exchange (TPE), often called plasmapheresis, is a powerful tool in the management of immune-mediated disorders. By removing harmful antibodies or toxins from the plasma, TPE offers hope and healing in conditions where the immune system turns against the body. In our tertiary care setting, we've seen its value across a wide range of disorders—from Autoimmune Encephalitis and Acute Liver Failure, Thrombocytopenic Thrombotic Purpura (TTP), Haemolytic Uremic Syndrome (HUS). This study brings together our real-world experience and patient outcomes with TPE. AIM : To Evaluate the impact of the therapeutic plasmapheresis on clinical outcomes in patients who underwent the procedure in a tertiary care setting through Retrospective analysis. METHOD : Retrospective analysis was conducted on plasmapheresis procedures performed in IMS & SUM Hospital, from January 2024 to June 2025. RESULTS : A total of 272 cycles in 63 patients (Male-26, Female-37), in an age group of 5 - 77 (average age - 41years) were enrolled in the present study, among which Longitudinally Extensive Transverse Myelitis (LETM-27%, n=17) was the main indication for TPE, followed by Guillain-Barre Syndrome (GBS-12%, n=8) , Neuromyelitis Optica Spectrum Disorder (NMOSD-7.9%, n=5), Thrombotic Thrombocytopenic Purpura (TTP-6.34%, n=4), Myasthenia Gravis (MG-6.34%, n=4). Post-TPE significant improvement was noted in clinical and laboratory parameters in most of the patients. In LETM cases, few patients have marked improvement in baseline power of limbs from 3rd cycle. In GBS cases, TPE led to significant improvement in muscle strength after 5th cycle. Mean hospital stay was reduced in patients responding well to therapeutic plasmapheresis Overall incidence of adverse reactions were 3.67%, out of that vascular blockage(1.1%) during procedure was a common complication encountered which was relieved by 0.9% NS flush followed by increase in blood pressure(0.73%) & temperature(0.73%) which were relieved by giving INJ.LABETALOL 20mg and INJ.PARACETAMOL10mg respectively and followed by Itchinhg in 0.36% which was relieved by INJ.HYDROCORT 50mg. CONCLUSION: This Retrospective analysis demonstrates that therapeutic plasmapheresis is an effective and safe adjunctive therapy that positively influences clinical outcomes across a range of indications. Further prospective studies are recommended to validate these findings and optimize patient selection criteria.

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TRALI IN A LIVER ABSCESS PATIENT: A CASE REPORTED IN A TERTIARY CARE HOSPITAL-INDIA.

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Background: The objective of this study is to explore the clinical presentation, diagnosis, treatment, and prevention of Transfusion-Related Acute Lung Injury (TRALI), using a real-life case involving Fresh Frozen Plasma (FFP). TRALI is a rare but severe immunological reaction to blood transfusion, characterized by acute lung injury occurring within 6 hours of transfusion. It presents with acute hypoxemia (SpO & lt; 90% on room air), bilateral pulmonary infiltrates on imaging, and no signs of fluid overload or alternative causes of ALI. TRALI most commonly follows transfusion of plasma-rich components like FFP, platelets, and cryoprecipitate. CASE SUMMARY: A 46-year-old male admitted on 26/03/2025 with a diagnosis of liver abscess and coagulopathy developed a transfusion reaction during administration of the second unit of FFP on 28/03/2025. The patient experienced breathlessness, fever, tachypnea, and tachycardia. On examination, bilateral wheezing was noted. MANAGMENT & PREVENTION: The transfusion was discontinued immediately. Supportive management was initiated, including administration of oxygen, antihistamines, corticosteroids, and antipyretics as indicated. Samples were sent for transfusion reaction workup, and transfusions were withheld for the next 24 hours. Preventive strategies include avoiding plasma donations from multiparous female donors and close monitoring of high-risk recipients. RESULT: Prompt discontinuation of transfusion and medical intervention were undertaken. A chest X-ray was advised, and transfusion was withheld for 24 hours. Continuous monitoring was maintained, and emergency measures were advised if required. CONCLUSION: TRALI, though infrequent, poses a serious risk and can be life-threatening. Prompt identification and implementation of preventive measures are crucial to ensure patient safety and improve transfusion outcomes.

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AN IMPACT OF SINGLE SESSION OF THERAPEUTIC PLATELEPHERESIS IN CASE OF SEVERE THROMBOCYTOSIS.

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Background: In hematological condition like Thrombocytosis characterized by abnormally high platelet count, increases the risk of the thrombotic or hemorrhagic complications.When patient with platelet count more than 8-10 Lakh/uL with symptoms associated with extreme thrombocytosis, Plateletpheresis in such patients plays main role in reduction of platelet count and symptomatic relief within short period of time. Aim: An Impact Of Single session of Therapeutic Plateletpheresis In Case Of Severe Thrombocytosis Case Summary- A 27 year old male, diagnosed with CML presented with C/o- 10-12 E/o Hematochezia (10-12 episodes) ,Fever with chills , Fatigue. Investigation Report Revealed elevated WBCs count (24340/cumm), Severe Thrombocytosis (4136 × 10^3/cumm). After treatment with Tab- Hydroxyurea 1gm TDS,concurrently with Tab- Cytarabine 100mg 1OD,Tab-Dasatinib 50 mg for a week fails to achieve reduction in platelet count,and hence no symtomatic releif was acheived ,hence proceded with the Therapeutic Plateletpheresis with Reinfusion of blood as “Emergency Measure”. Materials & Method- Pre-procedural assessment including Patient’s vitals were done. One Setting of Therapeutic Plateletpheresis with reinfusion of remaining blood components with the help of Fresenius COM.TEC Machine. Post procedural vitals were assessed. Result- After single setting of Therapeutic Plateletpheresis, Platelet count is reduced by 11 Lakh/uL,and and symptoms were relieved in the patient. Conclusion- It is very Effective and Reasonable to advice and perform plateletpheresis in the patient with platelet count of >8 to 10 Lakh/uL. In the the patient with severe Thrombocytosis with symptoms like headache ,dizziness,thrombotic or hemorrhagic changes single (1) setting of Plateletpheresis give effective result and also reduces the dose of medicine and period of adjuvant therapy.

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SYPHILIS SEROPREVALENCE AND ASSOCIATED RISK FACTORS AMONG BLOOD DONORS AT A TERTIARY CARE INSTITUTE IN EASTERN INDIA

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Background: Sexually transmitted infections such as syphilis impose major health and economic burdens globally. Understanding the trend of such infections in a given population is important for the efficient planning and implementation of disease control programs. Blood transfusion services are uniquely positioned to contribute to the population surveillance studies by providing snapshots of the immunity status against any emerging infections in the ethnic populations they serve. Globally, the incidence of syphilis has been observed to have dramatically increased recently. Syphilis, caused by Treponema pallidum, serves as a surrogate marker for high-risk activities in blood donors. This study aimed to determine the current seroprevalence of syphilis among blood donors at a blood center in Eastern India and identify associated demographic, behavioral, and other risk factors. Methodology: This prospective observational study was conducted from January 2024 to June 2025. A total of 25,295 consecutive whole blood donors were screened using a reverse testing algorithm, initially tested with a treponemal-antibody-based assay (Syphicheck® WB), followed by using chemiluminescent immunoassay (CLIA) on the Vitros® 3600 immunodiagnostic system and a nontreponemal test (RPR-Carbogen). Data on age, gender, donation status, education, occupation, sexual orientation, marital status, and tattoos/piercings were captured. Post-donation counselling and recall data were recorded and analyzed for sero-reactive donors, including high-risk behavior. Chi-square tests and multivariate logistic regression analysis were used to evaluate statistical associations and to identify independent risk factors. Results/Outcomes: The seroprevalence of syphilis was 0.55% (95% CI:0.45-0.64). Most donors who tested positive for syphilis were male (95.65%), with a significant portion falling within the 25-34 age group (42.75%) (OR=2.34, 95% CI:1.03-5.31). First-time donors showed higher seroreactivity (60.14%) than repeat donors (39.86%) (OR=3.09, 95% CI:2.20-4.36). Among all donors who tested positive for syphilis, 48.55% had an education level exceeding that of high school (OR=0.15, 95% CI:0.11-0.21). On recall, 2.90% of reactive donors disclosed that they belong to high-risk occupations (OR=3.63, 95% CI: 1.33-9.92), and 34.06% had tattoos or piercings beyond one year from the time of donation (OR=41.53, 95% CI: 28.70-60.10). Regression analysis identified several independent risk factors for syphilis seropositivity, including but not limited to tattooing and broken family status. Compared to the historical dataset (2013-2023), syphilis prevalence increased significantly from 130 per 100,000 in 2019 to 710 per 100,000 in 2025, indicating a resurgence. Co-infection analysis showed a highly significant association with HIV ($p<0.0001$, OR=26.32, 95% CI: 20.22-34.28). Conclusion: The resurgence of syphilis among asymptomatic blood donors, particularly young first-time male donors, indicates a possible unrecognized transmission of the disease within the community. Strong association with HIV further supports the role of syphilis as a surrogate marker for high-risk behaviors. This study shows the importance of strict TTI testing methods and focused counselling for risky behaviors to ensure blood safety and support public health monitoring. Finally, efforts should be made to promote repeat voluntary blood donation and to retain the donor pool, ensuring the safety of the blood supply.

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DRIVING QUALITY IMPROVEMENT IN OUTDOOR BLOOD DONATION CAMPS THROUGH A STRUCTURED QUALITY ASSESSMENT TOOL: EXPERIENCE FROM A TERTIARY CARE CENTRE

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Background: Driving Quality Improvement in Outdoor Blood Donation Camps Through a Structured Quality Assessment Tool: Experience from a Tertiary Care Centre Dr Aashna Gupta1, Dr Gajender Singh2, Dr Vaishali3 Senior Resident1, Professor and Head2, Senior Resident3 Department of immunohematology and blood transfusion, PGIMS Rohtak aashna.gupta23@yahoo.com Background: Voluntary blood donation is the foundation of a safe and adequate blood supply. In India, outdoor blood donation camps contribute significantly to meeting transfusion demands, especially in tertiary care hospitals. Outdoor voluntary blood donation camps are critical for sustaining blood supplies but often show variability in adherence to quality and safety standards. This study aimed to implement a structured quality assessment tool across multiple camps to identify gaps and drive targeted quality improvement. Methods: A prospective observational study assessed 100 outdoor voluntary blood donation camps organized by PGIMS Rohtak Haryana using a Quality Assessment Checklist covering seven domains: Pre-Camp Planning, Camp Infrastructure, Donor Registration & Selection, Phlebotomy & Infection Control Practices, Emergency Preparedness & Management, Documentation & Records, and Post-Donation Care & Feedback. Each domain included multiple indicators scored from 0 (not done) to 2 (fully compliant). Trained observers collected data via direct observation and document review. The internal consistency of the checklist was assessed using Cronbach's alpha to evaluate item homogeneity. Inter-rater reliability was measured with Cohen's kappa to determine agreement between different observers. Content validity was established through expert review. Results: The Quality Assessment Checklist showed an overall compliance of 77.4% across 33 indicators in 7 domains of outdoor voluntary blood donation camps. The tool demonstrated excellent psychometric properties with a Content Validity Index of 0.92, Cronbach's alpha of 0.87, and Cohen's kappa of 0.80. The results underscore both existing strengths and critical gaps, providing a clear direction for targeted interventions to improve camp quality and ensure donor safety. Conclusion: Implementing a structured quality assessment tool across 100 outdoor voluntary blood donation camps effectively identified critical gaps such as inadequate electrical backup, limited IEC materials, phlebotomy practices in large camps, and insufficient toilet facilities. Based on observations from the initial camps, targeted corrective actions were promptly undertaken to address these gaps, leading to measurable improvements in subsequent camps. This highlights the pivotal role of systematic audits in driving continuous quality improvement, enhancing compliance with national standards, and ultimately safeguarding donor health and satisfaction.

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OPTIMIZING BLOOD PREPAREDNESS: A VALIDATED TRANSFUSION PREDICTION TOOL FOR HIGH-VOLUME OBSTETRIC CARE

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Background: Peripartum haemorrhage remains one of the leading causes of maternal morbidity and mortality globally. In obstetrics, timely anticipation of blood transfusion requirements during high-risk deliveries is critical, especially in resource-constrained settings. Existing risk prediction models are either not tailored to local clinical contexts or focus on generalized obstetric populations without specific stratification according to risk-factors. Therefore, the development of a localized transfusion risk prediction model is important. This study is aimed to identify significant risk factors associated with perinatal transfusion during delivery and to develop and validate a logistic regression–based risk prediction model using retrospective delivery data from a tertiary care centre. Method This retrospective cohort study included deliveries conducted in a tertiary referral hospital across two consecutive years: 1st January 2023 to 31st December 2024. Maternal demographic, obstetric, and clinical variables were extracted from hospital records using a standardized coding sheet. Risk factors such as maternal age, gravida, parity, obesity, history of abortion, method of conception(in-vitro fertilization or normal), history of uterine procedure(cerclage, caesarean delivery or hysterotomy), placenta accreta spectrum, placental abruption, presentation (breech or transverse or vertex), uterine anomaly (bicornuate or unicornuate uterus), anaemia, coagulopathy, eclampsia, pre-Eclampsia, renal disease, heart disease, gestational diabetes, fetal macrosomia and hypertensive disorders were analysed. Outcome measures: • Primary outcome: perinatal blood transfusion as administration of atleast 1-unit PRBC intraoperative period or the first 12 hours postoperatively. • Secondary outcome: prediction of risk factors for multicomponent transfusion. Initially, univariate analysis was performed, and the significant risk factors were entered into the multivariate logistic regression. Eighty-twenty split was performed on entire data set which was used risk model creation (derivation group) and subsequent validation (validation group). Following multivariate analysis, nomogram was generated for predicting perinatal blood transfusion based on patient demographics and risk factors. Results Study population comprised of 5742 deliveries out of which 352(6.1%) required perinatal blood transfusion. Significant predictors of PRBC transfusion were Placenta accreta spectrum, Placental abruption, Pre-eclampsia, Severe anaemia (Hb < 7 g/dL), intra-uterine death, and coagulopathy. Additionally, 84 cases of multicomponent transfusions were identified which was associated with Abnormal placentation and coagulopathy. In validation group, the regression model had overall good sensitivity and specificity with above 84% patients correctly classified. Conclusion In high-volume tertiary care centres this locally derived and internally validated model will help clinicians to identify women at risk of perinatal blood transfusion. This will help to streamline preoperative cross-matching, activate donor replacement in rare blood type, and conserve component stocks especially Rh-negative inventory. this will altogether standardize preparedness for obstetric haemorrhage, reduce delays in product availability, and ultimately decrease preventable maternal morbidity and mortality.

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PREVALENCE OF HEMOGLOBINOPATHIES AMONGST YOUNG POPULATION IN GUJARAT

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Background: Hemoglobinopathies, including thalassemia syndromes and sickle cell disease, are widespread in Gujarat, particularly among the younger population. Genetic predispositions and long-standing endogamous practices have contributed to their high prevalence, leading to significant health challenges and straining medical resources. These disorders can result in chronic anemia, complications affecting multiple organ systems, and substantial socioeconomic burdens for affected families. Early identification through efficient screening methods like HPLC, along with genetic counseling and awareness programs, is crucial in mitigating their impact and reducing future transmissions. A well-structured public health approach is essential to address these inherited disorders effectively. Methodology Between July 2022 and June 2024, 1024 volunteers aged 15–29 were recruited after taking informed consent (from guardians in case of minors), from multiple locations in Gujarat following a brief awareness session. Blood samples were collected in EDTA tubes, and each participant's medical and family history was documented, especially noting any previous transfusions or transplants. All samples underwent a complete blood count (CBC) using a hematology analyzer and hemoglobinopathy screening via an automated HPLC analyzer. Samples with anemia or positive hemoglobin variants were further evaluated with peripheral blood smears, NESTROFT, and sickling tests. The integrated results from these tests and the collected histories formed the basis for establishing a hemoglobinopathy diagnosis, after which participants received personalized reports and genetic counseling. Outcome Among 1024 young participants, 65 (6.35%) were diagnosed with hemoglobinopathies via HPLC. β–Thalassemia Heterozygous was the most common form (34 individuals, 3.32%), identified by elevated HbA2, a microcytic hypochromic blood profile, and mild anemia. Rare forms, including β–Thalassemia Intermedia, β–Thalassemia Homozygous, and δβ–Thalassemia Heterozygous—were detected in single cases (0.09% each). Sickle cell disorders were observed in 20 individuals with heterozygosity (1.95%), two with homozygosity (0.19%), and one with HbS/β–Thalassemia compound heterozygosity (0.09%), along with a small number of HbD Punjab cases. Of the 214 anemic participants, 39 (18.22%) had hemoglobinopathies. Gender-specific analysis showed that males with β–Thalassemia trait tended to have higher hemoglobin levels and RBC counts compared to females. Conclusion This study highlights a significant burden of hemoglobinopathies among Gujarat's youth and the critical need for early detection. Using HPLC, we swiftly identified various hemoglobin variants, paving the way for effective screening and genetic counseling. In a context where costly treatments like stem cell transplants aren't feasible, combining mass awareness, targeted screening, and preventive counseling is key to reducing transmission and easing family burdens for a healthier future generation.

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A CASE REPORT ON DONOR REACTION NOTED IN BLOOD CENTRE, AIIMS RAIPUR

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Background: A Case Report on Donor Reaction Noted in Blood Centre, AIIMS Raipur Background and Aims Blood donation is a voluntary act that plays a vital role in healthcare. While generally considered safe, some donors may experience adverse reactions, most commonly vasovagal responses. These are usually mild but can occasionally become severe and result in injuries or complications. The objective of this report is to present a case of a severe vasovagal reaction in a young female donor, explore its clinical course, and highlight the importance of preventive measures and emergency response protocols in a blood donation setting. Methods A 20-year-old female visited the Blood Centre at AIIMS Raipur to voluntarily donate blood. She had no known history of chronic illness, allergies, or previous adverse reactions and was donating for the first time. Pre-donation screening showed she was clinically stable: weight 56 kg, hemoglobin 13.8 g/dL, blood pressure 110/70 mmHg, pulse rate 70/min, and body temperature 98°F. After donating 350 mL of blood and completing post-donation counselling, she proceeded to the refreshment room. On the way, she suddenly collapsed and lost consciousness. Emergency first aid was administered immediately on-site using the ABCD approach (Airway, Breathing, Circulation, Disability). The donor was shifted to the donation couch, placed in Trendelenburg position, and resuscitated promptly. Results Post-collapse vitals revealed a significant drop in blood pressure (90/50 mmHg) and pulse rate (40/min), while SpO remained at 98% and RBS at 90 mg/dL. The donor exhibited involuntary limb contractions, transient unresponsiveness, and plantar flexion. She also sustained injuries on her right forehead and chin due to the fall. Consciousness returned within a minute, and she was oriented to time, place, and person. The clinical picture was consistent with a Grade B1d vasovagal reaction, indicating a severe reaction with associated trauma. After initial stabilization, she was transferred to the emergency department for further observation and care. No seizure activity or signs of anaphylaxis were observed. Conclusions This case highlights a rare but important complication of blood donation. Severe vasovagal reactions, although infrequent, can lead to significant consequences including falls, injury, and psychological distress. Pre-donation counselling should stress the importance of adequate hydration and proper meals before donation. Medical staff should conduct thorough donor history assessments and remain prepared with emergency response protocols. The use of the ABCD approach and early intervention with Trendelenburg positioning and IV fluid administration can significantly improve patient outcomes. Finally, continuous training of staff and reinforcing donor safety protocols can help prevent similar adverse events in the future.

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FOUR YEARS, THREE PHASES AND ONE GOAL"- FOUR YEAR PHASE-WISE ANALYSIS OF BLOOD COMPONENT UTILIZATION IN HEMATOPOIETIC STEM CELL TRANSPLANTATION AT A TERTIARY CARE HOSPITAL IN NORTH INDIA

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Background: Hematopoietic stem cell transplantation (HSCT) serves as a definitive treatment option for several blood-related disorders. With the increasing frequency of HSCT procedures, demand of blood components has risen markedly. Transfusion needs differ based on the underlying illness, transplant timing, and type of donor and may present unique transfusion challenges. METHODOLOGY:- This retrospective observational study evaluated blood component utilization among 25 HSCT recipients over 4 years (2022–2025) at a tertiary care hospital in North India. Transfusion requirements were assessed across three phases of transplantation: pre-transplant (prior to day 0), peri-transplant (day 0 to +30), and post-transplant (day +30 to +100). Comparative analyses were conducted between allogeneic and autologous HSCT recipients, ABO-compatible and ABO-incompatible transplants and underlying diagnosis. RESULT :- The study included 25 patients (17 males, 8 females) with a mean age of 29.68 years (range: 7–55), all of whom received hematopoietic peripheral stem cell transplants. The most common diagnosis was aplastic anaemia (32%), followed by leukaemia (24%). Allogeneic HSCT (fully HLA matched (10/10) sibling donors) was performed in 56% of patients, while 44% underwent autologous HSCT. Among the allogeneic HSCT recipients, 64% were ABO compatible, 21% and 14% were major and minor ABO incompatible respectively with no cases of bidirectional ABO incompatibility. Over the study period, a total of 307 PRBCs, 1031 RDPs, 210 SDAPs, and 9 granulocyte transfusions were administered. Regarding transfusion practices, 12%, 24% and 44% of patients did not require any transfusion support during the pre-transplant, peri-transplant and post-transplant phase respectively. The highest utilization of PRBCs (6.84 units/ patient), and RDPs (20.52 units/ patient), was observed during the pre-transplant phase. SDPs were most frequently administered during the peri-transplant phase (3.76 units/ patient). Blood requirements were significantly higher ($p<0.05$) in allogenic donors in pre transplant phases. Although transfusion needs were higher in the peri- and post-transplant phases, the differences were not significant. Transfusion requirements did not differ significantly between ABO-compatible and ABO-incompatible transplants. Lymphoma patients had significantly lower PRBC use in the pre-transplant phase ($p = 0.028$), while aplastic anaemia and leukemia showed a higher usage of PRBC ($p = 0.073$ and 0.054 respectively). RDP and SDAP needs did not differ by diagnosis. In the peri-transplant phase, aplastic anaemia patients required significantly more RDP and SDAP ($p < 0.05$) with least being used in lymphoma and myeloma patients. In post-transplant phase, no significant difference was observed. Mortality was reported in two allogenic HSCT recipients of acute myeloid leukemia and severe aplastic anaemia. CONCLUSION: This study highlights that transfusion requirements were significantly higher in allogeneic HSCT recipients and in patients with aplastic anaemia and leukemia. A high dependency on platelet support was observed throughout transplant phases. To manage this demand, blood centers must maintain a dedicated pool of voluntary SDAP donors. Therefore, studying the pattern of blood utilisation during different transplant stages can help in planning transfusion support more effectively and may offer insights into the association between transfusion load and patient outcomes.

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WHEN FORWARD DOESN'T MATCH REVERSE: UNDERSTANDING ABO DISCREPANCIES

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Background: Blood grouping is essential in transfusion medicine. ABO grouping discrepancies—when cell (forward) and serum (reverse) grouping do not match—may result from ABO subgroups, naturally occurring irregular antibodies, or underlying clinical conditions. Identifying and resolving these discrepancies is critical to ensure transfusion safety. To evaluate the prevalence and causes of ABO grouping discrepancies among voluntary blood donors at the Indian Red Cross Society, Ahmedabad District Branch. Materials and Methods: A retrospective analysis was conducted on blood donations collected between January 2017 and June 30, 2025. Blood grouping was performed using the fully automated Qwalys analyzer (Diagast, France). Discrepancies identified were further investigated through serological work-up using conventional tube techniques. Outcome: Out of 4,73,510 blood donors screened, 112 (0.02%) showed ABO grouping discrepancies. Among them, 58 cases (51.79%) were attributed to weak or missing antibodies, 39 (34.82%) were subgroups of A, and 5 (4.46%) exhibited unexpected antibodies. The remaining cases involved Rh antigen variations, weak antigens, and B subgroups. Conclusion: The most frequent cause of ABO discrepancies was weak/missing antibodies, followed by A subgroups. Irregular antibodies, although less frequent, pose a significant challenge to compatibility testing. Comprehensive serological evaluation is imperative to resolve such discrepancies and to ensure reliable blood grouping and transfusion safety.

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ROLE OF THERAPEUTIC PLASMA EXCHANGE IN RENAL DISORDERS: A CRITICAL ADJUNCT IN NEPHROLOGY

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Background: Therapeutic plasma exchange plays a crucial role in managing immune-mediated and toxin-induced renal disorders, particularly where rapid reduction of disease mediators is vital to prevent permanent renal damage. Aims and Objectives: • To assess the clinical utility of TPE in managing renal disorders. • To analyse patient profiles, procedural characteristics, and outcomes following TPE. •To reinforce the significance of TPE in nephrology, particularly in critical immune-mediated pathologies. Materials and Methods: This is a retrospective observational study of patients of Renal Disorder treated with TPE during a period of one year (January 2024 – January 2025) in the department of Immunohematology and Transfusion Medicine, performed using the "Spectra Optia Terumo BCT Apheresis System". The data analysed included History, demographic data (sex and age), Biochemical parameters, underlying renal diagnoses, and TPE treatment details. Parameters such as volume exchanged, type of replacement fluid, frequency of sessions, and safety outcomes were reviewed. The replacement fluids used were 5% albumin and fresh frozen plasma (FFP). The volume exchanged was approximately 1–1.5 plasma volumes per session. A total of 5–7 sessions were conducted for almost every patient. Results: The study included 14 patients with nephrological disorders (8male and 6female). The age range was 20-60 years. The total number of sessions done were 64. The number and frequency of TPE procedures depended upon the the severity and clinical improvement of the patients as some required long-term maintenance. Nephrological diseases treated with plasmapheresis were rapidly progressive glomerulonephritis in 5 (35.7%) patients, Acute and chronic rejection Post kidney Transplant in 3 (21.4%) patients, Anti GBM disease/Good-pasture syndrome in 3 (21.4%) patients, 1 in SLE(severe lupus nephritis)with diffuse proliferative glomerulonephritis(7.14%),3 in TTP(Thrombotic Thrombocytopenic Purpura with atypical haemolytic uremic syndrome(21.4%).In our study, on an average of plasma exchange volume is 1 time patient's plasma volume in each session with 2180 ml of replacement fluid given in each session in which two-third of the fluid was replaced with albumin on an average 1480 ml in each session and one third was replaced with fresh frozen plasma i.e 843 ml. Complications like inadequate vascular access was common in (6.5%) and in few cases, machine error were reported due to machine breakdown (1.6%). Incidence of adverse reactions accounted to 9.83% (6/61); most common was hypotension (4.9%), followed by fever with chills (2.4%), nausea (1.2%) and allergic reactions (1.4%). No mortality occurred while performing TPE procedures in these patients. The overall mortality was 3 (21.4%). 1 Death in Rapid progressive Glomerulonephritis,1 in acute rejection following Renal Transplant and 1 in SLE(severe lupus nephritis) with diffuse proliferative glomerulonephritis. Conclusion: Therapeutic Plasma Exchange is a safe and effective modality for managing several immune-mediated renal disorders. Timely initiation and appropriate patient selection can improve renal outcomes and overall survival. This study further highlights TPE's role as a valuable adjunct in nephrology practice.

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VARIABILITY IN BLOOD COMPONENT UTILIZATION IN PHASES AND TYPES OF PEDIATRIC HEMATOPOIETIC STEM CELL TRANSPLANTATION

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Background: Blood component utilization varies across different phases of hematopoietic stem cell transplantation (HSCT). Pediatric HSCT presents unique transfusion challenges depending on transplant type, phase, and patient-specific variables. Understanding these patterns is crucial for efficient resource allocation and implementation of patient blood management strategies. Aim To analyze blood component utilization trends across different phases and types of pediatric HSCT and assess the impact of transplant characteristics (e.g., ABO incompatibility, transplant type, HLA matching of donor and recipient) on transfusion requirements. Method A retrospective analysis of pediatric HSCTs performed in 2024 (N=28 patients) was conducted. Data was collected from the ISBMT (Indian society of bone marrow transplantation) reporting hospital registry and patient charts. Transfusion requirements were recorded in three phases: Phase 1: Conditioning, Phase 2: Infusion to engraftment and Phase 3: Post-engraftment (up to discharge or mortality). Blood products analyzed included packed red blood cells (PRBC), single-donor apheresis platelets (SDAP), granulocytes (GRCT), fresh frozen plasma (FFP), and cryoprecipitate. Independent t-tests were used for statistical comparisons. Results A total of 28 pediatric HSCTs were analyzed (median age: 9 years; range: 7 months–17 years). PRBC usage increased across phases (Phase 1: mean 1 unit; Phase 3: mean 1.32 units). SDAP transfusions peaked in Phase 2 (mean: 2.05 units). ABO-incompatible transplants had higher PRBC requirements in Phase 1 (1.25 vs. 0.82 units) and Phase 3 (1.5 vs. 1.18 units), with a statistically significant increase in Phase 2 ($p = 0.037$). Autologous transplants required more PRBCs in Phase 1 (1.29 vs. 1) likely due to apheresis circuit priming needs and Phase 2 (1 vs. 0.6), but none in Phase 3. Allogeneic transplants required continued PRBC support and more SDAP (Phase 2 mean: 2.05 units). Haploidentical transplants showed significantly higher PRBC (Phase 3 mean: 2.67 vs. 0.1, $p = 0.039$) and SDAP (mean: 3.44 vs. 0.1, $p = 0.025$) usage compared to matched transplants. In the four patients who died, PRBC and SDAP usage was highest in Phase 3 (mean: 5.5 and 7.25 units, respectively). Conclusions This study demonstrates significant variation in blood component utilization across different HSCT phases and transplant types in pediatric patients. Allogeneic and especially haploidentical transplants required higher transfusion support than autologous or HLA-matched transplants. ABO incompatibility increased PRBC needs, particularly during conditioning. Patients with mortality showed markedly elevated transfusion requirements, highlighting the association of critical illness with higher blood product usage. These findings underscore the importance of tailored transfusion strategies and patient blood management in pediatric HSCT. Although the sample size limits diagnostic subgroup analysis, the observed patterns can inform clinical planning and resource optimization. Presenting author's contact details: Dr Anupa Pokhrel anupa000@gmail.com Assistant Professor, Department of Transfusion Medicine, PGICH. Sector-30, Noida, Pin-201303 Uttar Pardesh, India 9876228498 Author and co-authors' details: Dr Kriti Batni Senior Resident, Department of Transfusion Medicine, PGICH. Sector-30, Noida, Pin-201303 Uttar Pardesh, India Dr Satyam Arora Additional Professor, Department of Transfusion Medicine, PGICH. Sector-30, Noida, Pin-201303 Uttar Pardesh, India Dr Seema Dua Professor and Head, Department of Transfusion Medicine, PGICH. Sector-30, Noida, Pin-201303 Uttar Pardesh, India.

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EXTENDED RED CELL PHENOTYPING-BLESSING IN DISGUISE

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Background: With advancement in healthcare clinical practices and technology, blood usage has declined drastically. Red cell antigen alloimmunisation is the major challenge in current Transfusion practices. The need for implementing routine Rh-Kell phenotyping for all donors and patient screening is being realised all over the world to prevent the risk of alloimmunisation as far as possible. Fortis Escorts Heart Institute in India is a leading hospital in India, specialized in cardiology and other specialities has high input of pediatric and adult patients from all over the world. With a high number of cardiac surgeries and organ transplant programme running use of blood components is in accordance. Our patients may need repeated transfusions time, massive transfusions and at times undergo redo surgery having multiple transfusion episodes. So a high risk of alloimmunisation and antibody development exists. To eliminate the risk of alloimmunisation and ensure safer transfusions in patient's lifetime, our hospital is among the first few centre in India to introduce Rh-kell phenotyping for all patients and blood donors. Aims: To assess feasibility of doing extended red cell phenotyping and cost effectiveness Methods: Study Duration: 2012 – June 2025. All the patients anticipating blood transfusion and all donors subjected to Rh-kell phenotyping and 3 cell panel antibody screening as a routine. Results: Total samples tested 164812 : 98131 donors & 66681 patients (adult and pediatric) on fully automated immunohematology analyser- QWALYS 3 (Diagast, France) using Erythrocyte Magnetized Technology®. Data of the donor units are saved in the Microsoft Excel sheet with the donation & Unit details. Patient phenotyping and antibody screening (IgM +IgG) is done at the time of admission. For transfusion, ABO & phenotypically matched units are issued after an immediate spin cross match.Patient with positive antibody screening undergoes antibody identification and subsequently corresponding antigen negative blood is been arranged. Summary / Conclusions Introduction of Rh–Kell phenotyping of the donors and the patients has improved blood transfusion services drastically. It helped us in many ways: 1. In identifying the phenotype of our population 2. In providing antigen specific red cells to our patients thus ensuring another safety grid by avoiding alloimmunisation With regards to the high frequency of immunogenic antigens of the Rh-Kell systems, pre-transfusion antibody screening on patients' samples and Rh-Kell phenotyping on donors are essential and needs to be implemented. In long run it is cost effective measure.

PP 97

A FALSE ALARM OF HEMOLYTIC TRANSFUSION REACTION

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Background: Hemolytic transfusion reaction (HTR) is one of the most alarming and dreaded adverse events of transfusion for both the treating doctors and the transfusion medicine specialists. It leads to patient mortality / morbidity and legal ramifications on the health care workers involved. Hence, reporting of a HTR is to be done cautiously. The present case report is on one such patient whose symptoms mimicked an HTR but was actually a pseudo-hemolytic transfusion reaction. Methodology: A 44-year-old morbidly obese female with severe anaemia (Hb 4.9 g/dL) was admitted for evaluation of a right adrenal mass. Following proper immunohematological compatibility testing, two units of leukodepleted O RhD positive PRBCs were transfused over two days. While both transfusions were uneventful, the patient developed fever, chills, headache, tachycardia, and acute delirium 5 hours post-transfusion. A hemolytic transfusion reaction was suspected when the patient passed urine with a blood-tinged appearance. A full transfusion reaction workup was initiated as per national guidelines, including repeat clerical checks, visual inspection, blood grouping, antibody screening, crossmatching, Direct Coombs Test, and cold chain review. Outcome: All immunohematological and mechanical causes of hemolysis were ruled out. The post-transfusion blood sample showed no hemolysis, and the second urine sample was normal in colour. Urinalysis showed presence of blood cells, but there was no evidence of hemoglobinuria, hemolysis, urinary tract infection, or drug-induced discoloration. Upon further probing, a history of minor vaginal spotting was revealed by the patient's relative, which explained the transient discoloration of urine. The transfusion reaction was finally categorized as a febrile non-hemolytic transfusion reaction (FNHTR) with coincidental menstrual spotting mimicking hematuria. Conclusion: This case underscores the critical role of thorough clinical history and communication between clinical teams in accurately diagnosing transfusion reactions. Pseudo-hemolytic transfusion reactions can closely mimic HTRs and lead to diagnostic dilemmas. A systematic approach combined with careful patient assessment is essential to differentiate true hemolysis from mimicking conditions, thereby avoiding misclassification and unnecessary alarm.

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SMALL PATIENTS, BIG RESPONSIBILITY: A CALL FOR ROBUST REPORTING AND VIGILANT MONITORING OF PEDIATRIC ADVERSE TRANSFUSION REACTIONS

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Background: Blood transfusion is an indispensable therapeutic modality, especially in pediatric patients with hematological disorders, malignancies, surgical needs, and critical illnesses. Despite stringent regulatory guidelines and advancements in transfusion safety, pediatric transfusion practices present unique challenges. Children often manifest subtle and nonspecific clinical signs of adverse transfusion reactions (ATRs), and communication barriers may delay recognition. In addition, the diverse spectrum of underlying diseases and the higher prevalence of repeat transfusions in this age group increase the risk of ATRs. Data on the true burden and pattern of pediatric ATRs, especially from low- and middle-income countries, remain limited, leading to underrecognition and underreporting. This study aims to bridge this gap by assessing the incidence, distribution, and types of ATRs in pediatric patients in a tertiary care hospital in North India and to emphasize the importance of robust hemovigilance and timely reporting to improve transfusion safety in this vulnerable population. Methodology A retrospective observational study was conducted over a period of 2 years and 8 months (October 2022 – June 2025) in the blood centre of a tertiary care hospital in North India. Data were retrieved from the electronic transfusion management system (SafeTrans) and transfusion reaction workup records for pediatric patients aged birth to 17 years. Demographic parameters, transfused components, type and timing of ATRs, and patient transfusion history were analyzed. Outcome During the study period, a total of 13309 transfusions were administered to pediatric patients. The most frequently transfused component was random donor platelets [RDP] accounting for 44.4%), followed by packed red blood cells (PRBC) at 38.5% and fresh frozen plasma (FFP) at 15.6%. A total of 40 adverse transfusion events were recorded, giving an overall incidence of 0.30%. Among affected patients, 21 (52.5%) were male and 19 (47.5%) were female, and 29 (72.5%) had a history of multiple transfusions. Component-specific incidence revealed that 55% of ATRs occurred after PRBC transfusion, while 22.5% each were associated with RDP and FFP transfusions. More than half of these reactions (57.5%) occurred during routine hours (8 a.m-8 p.m). Allergic reactions were the most frequent type (17 cases, 42.5%), predominantly linked to RDP transfusions (52.9%), followed by febrile non-hemolytic transfusion reactions (FNHTR) (16 cases, 40%), of which 87.5% occurred following PRBC transfusions. There was no significant association between ATRs and patient age or underlying diagnosis. Conclusion The overall incidence of pediatric ATRs in our study was low (0.30%), yet these events remain clinically significant, especially in multiply transfused children and PRBC recipients. The findings highlight the critical importance of vigilant clinical monitoring, timely recognition, and comprehensive reporting of ATRs in pediatric transfusions. Strengthening hemovigilance systems, implementing regular staff training programs, adhering to evidence-based transfusion protocols, and adopting risk stratification strategies are essential for improving transfusion safety. Focused reporting and monitoring mechanisms tailored for pediatric populations will ensure early detection, appropriate management, and long-term improvement in transfusion practices for this vulnerable group.

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VASCULAR ACCESS IN APHERESIS AMONG KIDNEY AND LIVER DISEASES: A SINGLE-CENTRE STUDY ON ITS COMPLICATIONS AND INTERVENTIONS

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Background: Apheresis therapy (including therapeutic plasma exchange, LDL pheresis) is an important modality of treatment in kidney and liver diseases especially in a transplant setting. Temporary insertion of large-bore double lumen catheters (DLC) or presence of Arterio-venous Fistula (AVF) is necessary for efficient performance of the therapy. The appropriate selection of vascular access, and its optimal care and insertion site are essential to avoid complications. We have undertaken this study to look into the vascular access data of our apheresis patients, and procedure related complications and its outcomes during apheresis therapy (TPE and LDLpheresis). METHODS: We reviewed data from all patients undergoing apheresis (TPE and LDL pheresis) during a 1-year period (July 2024-25) in our tertiary hospital, Institute of Kidney Disease and Research Centre, IKDRC, Ahmedabad, India. All the TPE procedures were performed using FRESENIUS KABI COM.TEC®. Apart from patient baseline data, we collected data of clinical indication, disease aetiology, vascular access, procedure related complication including those due to blood transfusion during procedure. Statistical analysis was performed using SPSS version 22.0. RESULTS: During the study period, 151 patients had undergone 834 apheresis [776(93%) TPE procedures and 58(7%) LDL) procedures with a median of 4 procedures (1-25). Among them, 50 were females (3.6%) and the rest 101 (96.4%) patients were males. The median age was 16 (2–77) years. Among TPE, post renal transplant Acute B-cell Mediated Rejection (ABMR) was the most common indication contributing to 302 (36.1%) followed by Atypical Haemolytic Uremic Syndrome (aHUS) 253 (29%) and 65 (7.7%) pretransplant desensitisation among ABO incompatible and highly HLA sensitised renal transplant individuals attributing to 25 (3%) and 50 (6%) respectively, acute liver failure 46 (5.9%) and 35 (5.7%) for other causes such as anti-GBM disease, FSGS, and SLE. The vascular access used for the procedures are as follows: LAVF 196 (23%), RAVF 70(8.4%), LDLC 49(5.9%), RDLC 471(56.5%), RPC 14(2%), RFDLC 2(0.2%) and LFDLC 32(4%). There were 40 (4.7%) episodes of patient related complications during the TPE treatments. Among them, vascular access related complication was 7 (17.5%), 11 (28%) transfusion reaction related complication-10 allergic reactions due to FFP and 1 due to albumin, 15 (38%) citrate toxicity, one AVF swelling (reaccess done and procedure completed), six inlet flow issues-two in Left DLC, three Right DLC and one Left Femoral DLC. Among them, three resolved after saline flushing and in the other three patients, DLC was changed mid-procedure using guide wire and procedure was continued. CONCLUSION: This study provides valuable insights into the vascular access practices and associated complications during apheresis therapy at a transplant center in India. Our findings demonstrate the predominant use of central venous catheters, particularly the right double lumen catheter (RDLC). Vascular access related complications, highlights the critical role of appropriate vascular access selection and care to minimize complications and improve on the apheresis therapy nuances.

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MAXIMUM SURGICAL BLOOD ORDERING SCHEDULE (MSBOS) AT A TERTIARY CARE ONCOLOGY CENTRE

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Background: Despite over 12 million blood donations in India, a significant gap remains between the demand and supply of blood. Blood Transfusion Services (BTS) are challenged to maintain a fine balance between the supply of this limited resource and an ever-increasing demand. Many times, Blood ordering before surgery is excessive. One of the important policies to reduce this over-ordering is the 'Type and Screen' whereby units are not cross-matched until an actual need for transfusion occurs. The Maximum Surgical Blood Ordering Schedule (MSBOS) is a criterion developed from institutional usage statistics providing a figure for the number of units to be cross-matched for any given surgical procedure. Many International and national guidelines are available for the MSBOS, but there is a paucity of data about oncology patients. This study aims to formulate MSBOS at a tertiary care oncology centre along with evaluation of the crossmatch to transfusion (CT) ratio. Methods: One-year retrospective data were retrieved and analysed to assess transfusion requirements and preoperative blood crossmatch requisitions in adult surgical oncology patients. Each surgical procedure was grouped into different procedure categories determined by surgical subspecialty and relevant anatomical operative site. The data was analysed for age, gender, organ and type of surgery, pre-operative blood orders, Haemoglobin before and after surgery, pre-intra-post-operative requirement of Red Blood Cells (RBC), Fresh Frozen Plasma (FFP) and platelet transfusions. Results: A total of 6664 surgical events occurred during the study period, of which 659 surgeries were postponed or cancelled, leaving 6005 surgical events for analysis. A total of 14934 RBC units were cross-matched before the surgeries, but only 2262 RBC units were transfused, giving a high CT ratio of 6.6. A very high CT ratio of 34.62 was observed with plastic and reconstructive surgeries, whereas Gastrointestinal and Bone Soft tissue surgeries had the CT ratio of 4.33 and 4.48, respectively. Head and Neck Oncology (HNO) and Gastrointestinal Oncology (GIO) had the maximum number of surgical events, 2080 (34.64%) and 1295 (21.57%), respectively. GIO and HNO also had the maximum units of RBC transfusions, 884 (39.08%) and 415 (18.35%), respectively. As per the study, MSBOS recommended for surgical cases with significant expected blood loss, such as hemipelvectomy and hepatectomy, is 6 units crossmatch, whereas for cases of schwannoma excision and lung lobectomy, its 4 units crossmatch. For surgeries with low blood loss, such as craniectomy and ureterectomy, MSBOS is 2 2-unit crossmatch, and for other low blood loss surgeries, such as orchidectomy and stoma closure, MSBOS is only a Type and Screen. Conclusions: This study shows that an MSBOS created with Electronic Medical Records acquired data can be used to optimise the process of pre-operative blood ordering. Implementing an updated, institution-specific MSBOS has substantial advantages that include decreasing the number of pre-operative blood orders considered to be unnecessary, reducing the CT ratio, and decreasing overall costs without evidence of impact on patient safety.

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CLINICAL AND SEROLOGICAL CORRELATION OF POSITIVE DIRECT ANTIGLOBULIN TEST:A TERTIARY CARE BLOOD CENTRE EXPERIENCE

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Background: The Direct Antiglobulin Test (DAT) is a key diagnostic tool to detect in vivo sensitization of red blood cells with immunoglobulin and/or complement. It plays a vital role in evaluating autoimmune haemolytic anaemia (AIHA), haemolytic disease of the foetus and newborn (HDFN), drug-induced immune haemolytic anaemia, and haemolytic transfusion reactions. However, DAT positivity may also be seen in the absence of haemolysis across a spectrum of clinical scenarios. Aim & Objectives: To assess the clinical and serological profiles of patients with positive DAT. To evaluate the presence or absence of haemolysis in these cases. Materials and Methods: A retrospective study was conducted from June 2024 to June 2025, analysing 185 DAT-positive patients using the column agglutination technique. Further categorization into IgG and/or C3d was done using monospecific cards. Relevant clinical and serological data were reviewed, with specific attention to haemolytic status. Results: Among the 185 DAT-positive cases, the distribution was as follows: AIHA (42.7%), infectious diseases (24%), haematological disorders (14.05%), liver diseases (5.9%), neonatal jaundice (4.32%), antenatal cases (4.32%), hemoglobinopathies (3.24%), and cardiac conditions (1.08%). Evidence of haemolysis was observed in 88 patients (47.6%), while 97 patients (52.4%) showed no haemolysis. Conclusion: Positive DAT results may occur across diverse clinical conditions with or without haemolysis. Hence, a thorough clinical and serological correlation is essential to guide appropriate diagnosis and management.

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ELISA VS CLIA : A COMPARATIVE STUDY FOR TRANSFUSION TRANSMISSIBLE INFECTION SCREENING

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Background: Ensuring the safety of the blood supply is paramount in transfusion medicine, with rigorous screening for transfusion-transmitted infections (TTIs) being a cornerstone of patient protection. Human Immunodeficiency Virus (HIV), Hepatitis B surface Antigen (HBsAg), Hepatitis C Virus (HCV), and Syphilis remain significant global health concerns, necessitating highly sensitive and specific screening assays for every donated blood unit. Enzyme-Linked Immunosorbent Assay (ELISA) has long been the gold standard for serological screening due to its established reliability and widespread availability. However, advancements in immunoassay technology have led to the increasing adoption of Chemiluminescence Immunoassay (CLIA) systems, which offer potential advantages such as enhanced sensitivity, broader dynamic range, higher throughput, and automation capabilities. METHODS: This prospective study was conducted at regional blood transfusion centre Guru Teg Bahadur Hospital Delhi. It aimed to evaluate and compare the diagnostic performance of ELISA and CLIA methods for the routine screening of HIV, HBsAg, HCV, and Syphilis in 500 blood samples. Each sample was subjected to parallel screening for Human Immunodeficiency Virus (HIV), Hepatitis B surface Antigen (HBsAg), Hepatitis C Virus (HCV), and Treponema pallidum Hemagglutination Assay (TPHA) using both Enzyme-Linked Immunosorbent Assay (ELISA) and Chemiluminescence Immunoassay (CLIA) platforms. All assays were performed according to the manufacturers' instructions. Results from both methods were compared to determine concordance, discordance, and to calculate the sensitivity and specificity of each platform for the detection of the transfusion-transmitted infections. RESULTS A total of 500 blood samples were analyzed. For Human Immunodeficiency Virus (HIV) screening, 0.6% (3/500) were reactive by ELISA, while 0.4% (2/500) were reactive by CLIA. This reduction in reactive results by CLIA suggests an improved specificity, with CLIA demonstrating a lower rate of presumptive false positives compared to ELISA, while maintaining comparable sensitivity in detecting true reactive samples. For Hepatitis B surface Antigen (HBsAg), both ELISA and CLIA identified 2.4% (12/500) as reactive, indicating high concordance and comparable diagnostic performance in terms of both sensitivity and specificity. For Syphilis (TPHA) screening, 1.6% (8/500) were reactive by TPHA method, which notably reduced to 1.2% (6/500) by CLIA. This reduction points to enhanced CLIA specificity, as it yielded fewer initial reactive results. Furthermore, the incidence of equivocal TPHA results also significantly decreased with CLIA, streamlining the diagnostic pathway by reducing indeterminate findings. For Hepatitis C Virus (HCV), 1.2% (6/500) were reactive by both ELISA and CLIA, showing excellent agreement and comparable diagnostic performance. Overall, CLIA demonstrated a notable reduction in false positivity for HIV and Syphilis, suggesting superior specificity for these markers without compromising sensitivity. Results for HBsAg and HCV were highly comparable across both platforms, confirming their robust performance. CONCLUSION This study demonstrates that while both ELISA and CLIA methods are highly sensitive for screening, CLIA offers distinct advantages by significantly reducing false positivity and equivocal results. The findings suggest that CLIA platforms can enhance the specificity of TTI screening, potentially leading to more efficient blood bank operations.

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ANTI-I COLD AGGLUTININS AS DIAGNOSTIC BEACONS: UNMASKING MYCOPLASMA PNEUMONIAE VIA IMMUNOHEMATOLOGICAL SLEUTHING IN COLD AGGLUTININ HEMOLYSIS

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Background: Cold Agglutinin Hemolytic Anemia (Cold AIHA) is an autoimmune disorder marked by complement-mediated red cell destruction, often triggered by infections such as Mycoplasma pneumoniae. The presence of cold-reactive antibodies, particularly anti-I, can lead to significant immunohematological discrepancies that aid in early diagnosis. Case Summary: A 27-year-old male presented with a one-week history of fever, cough, and progressive dyspnea. Laboratory evaluation revealed visible agglutination in EDTA samples, elevated Mean corpuscular Hemoglobin (MCH) and MCH concentration (MCHC), Bilirubin, LDH. ABO blood grouping showed discrepancies, Direct Antiglobulin Test (DAT) was strongly positive for C3b. Cold agglutinin titer were high, and testing revealed reactivity with adult cells but not cord cells. A Hemagglutination Inhibition Assay with Human breast milk confirmed anti I specificity. Chest imaging showed right lower lobe consolidation with minimal pleural effusion. Subsequent Serology confirmed Mycoplasma pneumoniae infection. Management and Outcome: The Patient was treated with on i.v methylprednisolone and Azithromycin along with thermal protection to prevent cold induced hemolysis. The patient showed rapid clinical recovery with resolution of pulmonary and hemolytic manifestation. Conclusion: This case highlights the diagnostic importance of immunohematological Clues in cold agglutinin disease such as anti-I detection helping to identify underlying Infectious Etiology. It underscore the synergy of traditional serologic expertise and precision immunodiagnostics. Early recognition and multidisciplinary intervention remain critical to ensure prompt diagnosis and management of rare, reversible presentation of Cold AIHA.

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NOT SO UNIVERSAL AFTER ALL: ANALYSIS OF ABO ISOAGGLUTININ TITERS AND DONOR DEMOGRAPHICS IN GROUP O PLATELETPHERESIS DONORS AT A TERTIARY CARE ONCOLOGY CENTRE.

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Background: Patients with hemato-oncology conditions rely significantly on single-donor platelet transfusions during their treatment. Due to the scarcity of group-specific SDPs, these patients frequently receive SDPs from various nonspecific blood groups. However, the transfusion of O group plasma to non-O group recipients, especially of group A, can occasionally lead to severe destruction of red blood cells. In addition to acute hemolysis, other consequences of incompatible SDP transfusions may include hemoglobinemia, jaundice, progressive anemia, spontaneous agglutination, a positive direct antiglobulin test, and heightened osmotic fragility of the patient's red blood cells. Sera from individuals with the O blood group contain two distinct antibodies, anti-A and anti-B, along with a cross-reacting antibody known as anti-A,B (predominantly IgG). In India, it is not a requirement to screen group O platelet donors for ABO titrations. Therefore, this study was conducted to assess the levels of agglutinins in platelet donations. Methodology: A retrospective observational study conducted at a single center spanned 6 months, from January 2025 to June 2025, focusing on 351 plateletpheresis donors. Blood samples from donors of the O blood group who underwent plateletpheresis procedures were analyzed for anti-A and anti-B (IgM and IgG) isoagglutinin titers utilizing the IMMUCOR Galileo Neo Iris platform, employing Solid Phase Red Cell Adherence (SPRCA). Statistical analysis was performed to evaluate correlations between elevated titers and demographic factors ($p<0.05$). Outcome: Donors aged 18 to 30 years demonstrated elevated anti-A IgM titers ($p=0.002$). A statistically significant clinical correlation was found between reduced hematocrit levels and increased anti-A IgM titers ($p=0.018$). The prevalence of high titers for IgM anti-A was recorded at 6.3%, while IgG anti-A was at 16.3%. In contrast, the prevalence of anti-B IgM titers was 6.6%, and IgG titers were 21.4%. Over 93% of Group O SDP donors showed anti-A and anti-B IgM titers of ≤64. The prevalence of high titers did not reveal any statistical significance concerning gender or the type of donation, whether voluntary or replacement. Conclusion: This research indicates that individuals over 30 years of age who voluntarily donate through plateletpheresis should be chosen as platelet donors in cases of non-identical ABO transfusions. Furthermore, the titration of ABO antibodies in blood centers will enhance safety during non-identical ABO transfusions.

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FACTORS AFFECTING ALLOIMMUNIZATION AND AUTOIMMUNIZATION IN TRANSFUSION-DEPENDENT THALASSEMIA PATIENTS AT A TERTIARY PEDIATRIC CARE INSTITUTE

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Background: This prospective observational study evaluated alloimmunization and autoimmunization in 107 pediatric transfusion-dependent thalassemia (TDT) patients over one year at a tertiary care center in North India. Alloantibodies were detected in 5.6% and autoantibodies (DAT positive) in 15.9% of patients. 83% of alloantibodies belonged to the Rh system. Significant risk factors included age at first transfusion >1 year, higher mean age, Rh D-negative blood group, and shorter transfusion intervals. All patients received ABO and RhD-matched leucoreduced units. Study highlights the importance of extended antigen matching, particularly for Rh and Kell antigens, to reduce immunization risks in pediatric TDT patients. Background Thalassemia, a genetic disorder, requires lifelong RBC transfusions to manage hemoglobin levels(9-11g/dl). Alloantibodies against RBC antigens can complicate transfusions, reducing efficacy and increasing risks like hemolytic reactions and iron overload. There are variable alloimmunization rate ranges (4%-50%) in different parts of our country however there is a lack of data from the region of western UP. This study aimed to analyze the factors affecting alloimmunization and autoimmunization development in pediatric transfusion-dependent thalassemia (TDT) patients. Methodology This was a prospective observational study in a tertiary pediatric hospital from North India, done on TDT patients registered at our centre over 1 year. The tests performed were ABO and Rh-typing, direct and indirect antiglobulin tests, antibody screening and identification for every visit for blood transfusions. Results A total of 107 pediatric TDT patients (67 males and 40 females) were enrolled, aged from 6 months to 18 years with a mean of 6.12±5.02 years. Among them, 93 patients had β-thalassemia major, 7 had E/β-thalassemia, and 7 had thalassemia intermedia. All patients received ABO and RhD-matched leucoreduced units (1 log) and none were splenectomized. The mean age of 1st transfusion was 1.33 ± 1.71 years (Range 1.5 months-10 years). Alloantibodies were identified in 6 (5.60%) patients, and 17 (15.90%) patients had a positive direct antiglobulin test (DAT). Alloantibodies identified were from Rh blood group system (Anti-E=2, Anti-D=2, Anti-Cw=1) and Kidd blood group system (Anti-Jka=1). There was statistically more risk of allo/auto-immunization in pediatric TDT patients who received their first transfusion after 1 year of age (p=0.003), who had higher mean age (p=0.001) and Rh(D) negative blood group for alloimmunization (p=0.016). Patients with alloimmunization and autoimmunization had shorter interval between two transfusions (p=0.04), as compared to non-immunized. Conclusion The incidence of alloimmunization and autoimmunization in pediatric TDT was 5.6% and 15.9% respectively. The majority of alloantibodies belonged to Rh blood group system. Thus, further highlighting need to provide Rh and Kell matched units to TDT patients.

PP 106

QUALITY IN EVERY DROP: LEVERAGING KEY PERFORMANCE INDICATORS TO DRIVE EXCELLENCE IN TRANSFUSION SERVICES

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Background: Blood transfusion services are a critical pillar of healthcare, ensuring safe and appropriate use of blood products. The principle of delivering the "right blood to the right patient at the right time and place" underscores the importance of continuous quality improvement (CQI). Key performance indicators (KPIs) are central in monitoring and sustaining quality standards. The National Accreditation Board for Hospitals and Healthcare Providers (NABH) has established rigorous quality metrics for transfusion services in India. Adherence to these KPIs and timely corrective and preventive actions (CAPA) drives patient safety, resource optimization, and accreditation readiness. Aim: To evaluate transfusion service quality by assessing performance across NABH-defined KPIs at a tertiary care blood Centre. Objectives: • To monitor and evaluate the annual trends of NABH KPI quality indicators in transfusion services. • To identify gaps in service quality and implement data-driven corrective actions. • To benchmark institutional performance against national standards to support accreditation and continuous quality improvement. Methods: A retrospective, observational study was conducted at the NABH-accredited blood centre of NIMHANS, Bengaluru, over one year (January–December 2024). Monthly data on ten NABH-defined KPIs were extracted from internal quality records and hospital information systems. These KPIs included transfusion-transmitted infection (TTI) rates, adverse transfusion reactions (ATR), component wastage, donor deferrals, adverse donor reactions (ADR), quality control (QC) failures, voluntary donation rates, quantity not sufficient (QNS) units, turnaround time (TAT), and delayed transfusions. Descriptive analysis was performed to track trends. Outliers were investigated using root cause analysis, and CAPAs were implemented. Results: Analysis of ten NABH-defined KPIs from January to December 2024 demonstrated substantial compliance, with over 75% of quality standards consistently met throughout the year. The combined TTI rate ranged from 0.20% to 2.49%, peaking in September (14 cases), with syphilis and HBV being the most frequently detected. Adverse transfusion reactions varied monthly from 0.07% to 1.11%, with the highest incidence (16 cases) reported in December. Component wastage rates at the blood centre ranged between 2.34% and 10.68%, with random donor platelets contributing to most discards; ward return discards were negligible. Adverse donor reactions fluctuated widely, peaking at 195.3% in March, reflecting the impact of a low donor base. Donor deferral rates ranged from 0% to 9.4%, with noticeable increases during mass donation drives. Voluntary blood donations consistently remained above 70%, reaching a peak of 91.3% in October. QC failures were minimal; PRBC failures occurred in January and February (25% each), and FFP failures peaked at 25% in October. The QNS unit rate remained within acceptable limits (0.19%–1.24%). Root cause analyses for outliers led to targeted CAPAs, including staff retraining, process revalidation, and stricter donor screening protocols, improving compliance and minimizing recurring deviations. Conclusion: Monitoring NABH-defined KPIs provides actionable insights into transfusion service quality. This approach enables proactive interventions, improves patient safety, and fosters a culture of continuous improvement. Implementing CAPAs strengthens accreditation readiness and ensures high standards in donor-to-recipient care. Quality assurance measures are vital for safe, efficient, and patient-centric blood transfusion practices in public healthcare settings.

PP 107

CHANGE IN DONOR PARAMETERS AFTER PLATELETPHERESIS: COMPARISON OF SINGLE DOSE V/S DOUBLE DOSE PLATELETPHERESIS

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Background: Change in donor parameters after plateletpheresis: Comparison of single dose v/s double dose plateletpheresis Background The increasing clinical demand for apheresis platelets, especially in tertiary care and oncology settings, has led to a growing preference for high-yield or double-dose plateletpheresis . This shift is particularly important in developing countries where the apheresis donor pool remains limited. Collecting more platelets per donation improves inventory management but also raises concerns about donor safety and post-procedural recovery. This study aimed to compare single and double-dose plateletpheresis with respect to target yield, donor platelet recovery, and haematological changes post-donation Methodology A total of 247 plateletpheresis procedures were analysed, comprising 174 double dose platelet (70.45%) and 73 single dose platelet (29.55%) collections. All procedures were performed on healthy, blood donors who met eligibility criteria. Pre- and post-procedure venous samples were analysed for complete blood count (CBC), including hemoglobin, white blood cell (WBC) count, and platelet count. Platelet products were tested for total yield. Each collection was split and supplemented with Platelet Additive Solution (PAS) to assess yield variation with and without PAS. Additional procedure metrics such as total acid citrate dextrose (ACD) used, calcium supplementation, total blood volume processed, collection efficiency, and donor platelet loss were recorded and analysed. Ethical clearance taken. Outcome Baseline hemoglobin levels were higher in the double dose platelet group (14.6 g/dL) compared to the single dose platelet group (13.37 g/dL). Post-procedure hemoglobin dropped by 0.89 g/dL in double dose platelet and 1.1 g/dL in single dose platelet donors. Similarly, pre-procedure WBC counts were higher in the double dose platelet group (7.74 $\times 10^9$/L) than in the single dose platelet group (6.86 $\times 10^9$/L). Platelet counts were significantly higher in double dose platelet donors both pre (284.4 ×10/L) and post-procedure (181 $\times 10^9$/L) compared to single dose platelet donors (187 ×10/L pre, 132 ×10/L post), with a larger absolute platelet drop in the double dose platelet group (103 vs. 55 ×10/L). Procedure metrics revealed increased ACD usage (313.57 mL vs. 283.86 mL) and calcium supplementation (1439.29 mg vs. 1300 mg) in the double dose platelet group. The average blood volume processed was also higher for double dose platelet (3223.14 mL vs. 2929 mL). Mean platelet yield was significantly greater in double dose platelet (5.43 $\times 10^{11}$) compared to single dose platelet (2.83 $\times 10^{11}$). PAS subgroup analysis showed mean platelet count with PAS were 1296 (double dose platelet) and 1,105 (single dose platelet) with a final yield of 5.43 X10 e11 and 2.84 X10e11 respectively. Where as platelet count without PAS were 3350.86 (double dose platelet) and 3462 (single dose platelet). Conclusion Double-dose plateletpheresis substantially enhances product yield and helps optimize platelet inventory in settings with limited donor availability. Implementing safeguards will support high-yield collections while maintaining long-term donor retention and safety. There was no significant loss of blood as evident by Hb value and platelet .Double dose platelet can be an effective strategy in resource-limited transfusion services when guided by appropriate donor management protocols. Induction of PAS would also help in optimising the usage.

PP 108

COMPARATIVE EFFICACY AND SAFETY OF STANDARD VERSUS HIGH VOLUME PLASMA EXCHANGE IN ACUTE LIVER FAILURE: A SINGLE-CENTER EXPERIENCE

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Background: Acute liver failure (ALF) is associated with fatal outcomes without liver transplantation. Two randomized studies reported standard volume (SV) and high volume (HV) plasma exchange (PLEX) as effective therapeutic modalities for patients with ALF. However, no studies have compared the safety and efficacy of SV with HV PLEX, which we aimed to assess. Methods: This retrospective study included patients with ALF admitted between March 2021 and March 2023 who underwent PLEX. All patients underwent HV PLEX until May 2022, and then thereafter, SV PLEX was performed. The objectives of the study were to compare transplant-free survival (TFS) at 30 days, efficacy in reducing severity scores, biochemical variables, and adverse events between SV (total plasma volume x 1) and HV (total plasma volume x 1.5–2) PLEX. Results: Forty two ALF patients (median age: 23.5 years; females: 57.1%; MELD Na: 34.67 ± 6.07; SOFA score- 5.24 ± 1.42) underwent PLEX. Of these, 22 patients underwent SV-PLEX, and 20 underwent HV-PLEX. The mean age, sex, etiology distribution, and severity scores were similar between the groups. The median number of PLEX sessions (2) was similar in both groups. On Kaplan–Meier analysis, TFS was 45.5% in SV group and 45% in HV group (P = 0.76). A comparable decline in total bilirubin, PT/INR, ammonia, and MELD Na scores was noted in both groups. The cumulative number of adverse events was similar between the HV group (77.3%) and SV group (54.5%; P = 0.12). Conclusions: SV PLEX is safe and as effective as HV PLEX in patients with ALF. Further randomized controlled trials with a larger sample size are needed to validate these findings.

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"THE SAB GAP": Unrepresented HLA Alleles in Single Antigen Bead assay and Antibody-Verified Epitopes in the Indian Population

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Background: Single Antigen Bead (SAB) assays are central to virtual crossmatch (VXM) protocols in solid organ transplantation, allowing for sensitive detection of donor-specific antibodies (DSAs). However, their accuracy depends on the inclusion of relevant HLA alleles within the assay panel. Under represented HLA profiles in SAB panels for populations that are unique and diverse—such as those in India may be disproportionately affected by allele omissions, resulting in undetected DSAs and potential graft risk. Methods This retrospective study analysed 535 solid organ transplant donor–recipient pairs of Indian origin over a five-year period. Donor HLA alleles were assessed for representation in two commercial SAB panels (Panel A and Panel B). To maintain confidentiality specific names of the SAB panel manufacturers have been withheld. Alleles absent from both or either panel were recorded, and eplet-level immunogenicity was evaluated using HLAMatchmaker and the HLA Epitope Registry to determine antibody verification and exposition status. Results At least one unrepresented allele was identified in 192 (35.8%) out of 535 cases. Panel A lacked 42 alleles, and Panel B lacked 67 alleles, with 32 alleles absent from both. HLA Class I alleles—especially HLA-B locus accounted for most omissions. Several commonly occurring alleles, including HLA-DRB1*13:02, HLA-B*35:03, and HLA-A*02:11, were completely unrepresented from both panels, despite expressing antibody-verified eplets such as 47F, 44RT, and 150AAH, known to elicit allo-immune responses. Although Panel B had more unrepresented alleles overall, it did include some regionally prevalent alleles such as HLA-B*40:06, which were entirely absent in Panel A. Over 80% of unrepresented alleles carried at least one high-exposition eplet, and nearly 70% harbored antibody-verified epitopes. Conclusion Current SAB panels inadequately represent HLA alleles common in the Indian population, potentially leading to false-negative DSA results and compromised virtual crossmatch accuracy. Importantly, epitope analysis revealed that many unrepresented alleles harbour highly immunogenic, antibody-verified eplets. This underscores the growing relevance of epitope-based matching in transplant immunology. Epitope mismatches have been associated with increased risk of de novo DSA formation, antibody-mediated rejection, and poorer graft outcomes. Notably, selecting SAB panels based solely on number of unrepresented alleles is not advisable, as each panel includes unique, clinically relevant alleles. Until more region-specific panels are available, incorporating epitope-based analysis is essential for accurate risk assessment and improved transplant outcome.

PP 110

PRE-LATENT AND LATENT IRON DEFICIENCY IN PROSPECTIVE WHOLE BLOOD DONORS AT TERTIARY CARE HOSPITAL IN INDIA

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Background: This single-centre cross-sectional observational study was conducted at AIIMS Raebareli to evaluate the prevalence of pre-latent and latent iron deficiency in prospective blood donors with haemoglobin levels between 10–15 g/dL. A total of 1,550 donor samples were initially enrolled, out of which 1,380 were analyzed after exclusions. Serum ferritin, reticulated haemoglobin (Ret-Hb), and serum iron were used to assess iron status. The study found a significant proportion of donors with normal haemoglobin levels (≥12.5 g/dL) had depleted iron stores, highlighting the inadequacy of haemoglobin alone as a screening criterion. Incorporating iron indices in donor screening protocols may help safeguard donor health and improve transfusion efficacy. Background According to the Drugs and Cosmetic Act (1945), the haemoglobin cut-off for blood donation in India is ≥12.5 g/dL, irrespective of gender. This criterion prevents donations from overtly anaemic individuals but fails to exclude those with subclinical iron deficiency (pre-latent or latent stages), potentially worsening their iron status after donation. Iron deficiency, even in the absence of anaemia, can lead to donor fatigue, impaired well-being, and suboptimal quality of red blood cells. This study was designed to assess the prevalence of early iron deficiency among potential donors and evaluate the diagnostic value of iron indices and Ret-Hb compared to conventional haemoglobin and RBC parameters. Methodology This was a prospective, cross-sectional diagnostic accuracy study conducted at the Department of Transfusion Medicine, AIIMS Raebareli. 1,550 prospective whole blood donors with haemoglobin between 10–15 g/dL were enrolled after informed consent. Hemoglobin was estimated using HemoCue 301. EDTA and plain blood samples were collected for complete blood counts, Ret-Hb, serum ferritin, iron, TIBC, transferrin saturation (TSAT), and C-reactive protein (CRP) if needed. Donors with Hb <12.5 g/dL were deferred as per guidelines, but included for analysis. Final data analysis included 1,380 samples. Statistical analysis was performed using R software. Outcome Out of 1,380 samples, 27.2% had low serum ferritin (<30 µg/dL), 4% had low Ret-Hb (<25 pg/cell), and 17% had low serum iron (<50 µg/dL). Among donors with haemoglobin ≥12.5 g/dL, 26.4% still showed depleted iron stores based on ferritin levels. These associations were statistically significant ($p<0.05$) for ferritin, Ret-Hb, and serum iron, but not for TIBC or TSAT. This indicates that a substantial proportion of donors classified as eligible based on haemoglobin alone may have subclinical iron deficiency. Conclusion Hemoglobin alone is an insufficient parameter to detect iron deficiency in blood donors. A considerable proportion of donors with acceptable haemoglobin levels had depleted iron stores, posing risks to donor health and the quality of blood components. The study strongly recommends revising donor eligibility guidelines by integrating iron indices such as serum ferritin or Ret-Hb into routine screening. These measures would promote donor safety, improve blood component quality, and support long-term sustainability of voluntary blood donation programs.

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KNOWLEDGE, ATTITUDE, AND PRACTICE STUDY ON BLOOD DONATION IN BANARAS HINDU UNIVERSITY AND OTHER COLLEGE STUDENTS

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Background: Abstract Blood donation is an essential activity that preserves millions of lives annually. In spite of heightened awareness initiatives, the frequency of voluntary blood donation continues to be low in numerous developing nations. This research seeks to evaluate the knowledge, attitudes, and practices concerning blood donation among university students. A cross-sectional survey was carried out involving 2000 students from different fields of study, utilizing a structured questionnaire. The findings indicated that although most participants possessed sufficient knowledge and a favorable attitude, only a limited number had actually engaged in blood donation. The study suggests the implementation of targeted awareness programs and motivational campaigns to enhance participation in blood donation efforts. Keywords: Blood donation, students, voluntary.

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TRANSFUSION INSIGHTS: A DEEP DIVE INTO THE BLOOD AND IT'S COMPONENTS UTILIZATION IN A TERTIARY CARE CENTER

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Background: Transfusion of blood and its components plays a pivotal role in the management of various medical and surgical conditions. However, irrational or excessive use of blood products can lead to increased costs, unnecessary exposure to transfusion-related risks, and depletion of limited resources. In high-volume tertiary care hospitals, evaluation of transfusion practices becomes essential to ensure optimal and evidence-based use. A data-driven analysis of transfusion practices helps in evaluating usage patterns, identifying areas of overuse or underuse and improving transfusion protocols. Aim: To evaluate the utilization pattern of blood and its components in a tertiary care hospital, identify trends across various clinical departments and assess the appropriateness of transfusion practices. Material and Methods: A retrospective observational study was conducted in the Department of Transfusion Medicine, MLN Medical College over a period of 5 months. Data were collected from transfusion request forms, issue registers and electronic records , including total units of blood and its components issued, type of components (PRBC, FFP, Platelets,) and their department wise clinical indications. Parameters such as crossmatch to transfusion ratio (C:T ratio), transfusion probability (%T) and transfusion index (TI) were calculated to evaluate efficiency and appropriateness of blood use. Results: During the study period of 5 months, a total of 6478 transfusion requisitions were received and 8265 blood components were issued. The total cross-matched PRBC units were 4518 and total PRBCs transfused were 2873. C/T ratio was found to be 1.57. Transfusion Probability and TI were calculated as 74 and 0.94 Conclusion: The study highlights the importance of continuous monitoring of blood and component utilization to optimize and improve transfusion practices. the overall utilization was within acceptable standards, certain departments exhibited tendencies toward over-ordering. Implementation of maximum surgical blood ordering schedules (MSBOS) and clinician education can enhance judicious use of blood products, reduce unnecessary crossmatching and improve overall transfusion practices in tertiary care settings.

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AN INTERESTING CASE OF BLOOD GROUP DISCREPANCY IN VOLUNTARY BLOOD DONOR FROM RAJKOT, GUJARAT.

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Background: The AB positive blood group typically expresses both A and B antigens along with Rh (D), making it serologically straightforward. However, weak A or B within AB individuals can lead to blood group discrepancies, complicating transfusion practices and donor classification. This abstract highlights a case involving a "weak B antigen" in an AB positive donor, resulting in conflicting forward and reverse grouping results. The B antigen is created by the addition of Galactose by B transferase enzyme, while the A antigen involves N-acetylgalactosamine done by A transferase enzyme. In AB individuals, both enzymes are active, producing both antigens simultaneously. Case report: A 26-year-old male donor donated blood at the blood centre in Rajkot, Gujarat. There was no significant history. His haemoglobin was more than 12.5 gm% and his weight was 65 kg. He was accepted for donation based on the screening criteria as per NBTC guidelines. 450 ml of whole blood along with pilot tube samples were collected. Blood grouping was performed using the SPRCA and CTT method, revealing a discrepancy between cell and serum grouping. The donor's red cells gave positive reaction with Anti-A & Anti-AB, Anti A1, Anti-H, Anti D1,Anti-D2, whereas serum grouping, A cell, B Cell & O cell were negative at room temperature. Serological testing revealed no agglutination with anti-B but strong reactions with anti-A and anti-AB, suggesting a discrepancy. Weak reactions are usually the discrepant reactions. Antibody problems are much more common than antigen problems. There was no h/o any illness or immunity issue of the donor. So, serum IgM and IgG were done, which turned out to be normal. It was established that there was no issue in detecting antibody. Testing at room temperature, 37°C and 4°C, considering it as an antigen problem, was done. Reaction patterns were same at room temperature and at 37°C, but at 4°C Anti-B gave Wk+ reaction. The blood grouping pattern turned out to be a Type II blood group discrepancy, suggesting a weaker "B antigen". For the confirmation, Cold Adsorption and Heat Elution were carried out which confirmed the presence of B antigen. These findings were consistent with the reactivity pattern of the AB Positive blood group, having weak expression of B antigen. Conclusion: Cell & serum groping must be done meticulously. Blood group discrepancy should always be resolved with a definite protocol in place, in order to avoid potentially dangerous haemolytic transfusion reactions.

PP 114

TO EVALUATE PREVALENCE AND CLINICAL SIGNIFICANCE OF DAT POSITIVITY IN A STAND-ALONE BLOOD CENTRE.

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Background: The Direct Antiglobulin Test (DAT), also known as the Direct Coombs Test, is a critical laboratory assay used to detect in vivo sensitization of red blood cells (RBCs) by IgG antibodies and/or complement component C3d. Dual positivity for IgG and C3d suggests a mixed-type immune response, often associated with more severe haemolysis. DAT positivity is frequently associated with autoimmune haemolytic anaemia (AIHA) and other immune-mediated haemolytic conditions. This study aimed to investigate the clinical significance of DAT positivity by comparing the characteristics of patients with IgG, C3d, and IgG/C3d-positive results. Methods: A retrospective study was conducted on 266 patients with polyspecific DAT-positive results, identified at stand-alone blood centre in Rajkot, Gujarat, between August 2022 to June 2025. Polyspecific DAT-positive samples were further analyzed using monospecific anti-human globulin (AHG) reagents to determine the presence of IgG, C3d, or both on the red blood cells. The patients with positive polyspecific DAT were categorized into different clinical conditions. The presence or absence of in vivo haemolysis was evaluated in all clinical categories and also for each grade of positivity with polyspecific and monospecific antiglobulin gel card method. DAT positivity was graded (1+ to 4+) in each patient. Results: Total 959 samples 477 (49.7%) male & 482 (50.3%) female were tested, 266 (27.74%) patients were positive with polyspecific DAT, 168 (63.16%) were IgG positive, 77 (28.95%) patients were positive with IgG+C3d and 21(7.89%) patients were only C3d complement positive. Total 177 (66%) had haemolysis whereas 89 (34%) hadn't. All 21 patients who showed only C3d positive, didn't show hemolysis. It was observed that with increasing grades of DAT positivity, incidence of in vivo haemolysis was seen. So, it is important to clinically and serologically correlate positive DAT results. The study population exhibited a diverse range of clinical diagnosis. Autoimmune Haemolytic anaemia was the most frequent diagnosis followed by thalassemia major, sickle cell anaemia, infective pathology, pancytopenia and thrombocytopenia. Conclusion: "IgG" positivity was the most common finding in DAT-positive patients, highlighting the prevalence of warm AIHA. The presence of C3d, alone or with IgG, suggests the involvement of complement activation and may indicate a different underlying pathology. This study emphasizes the use of monospecific AHG reagents to differentiate between IgG, C3d, and IgG/C3d positivity. It is crucial for accurate diagnosis, appropriate management, and informed clinical decision-making.

PP 115

RFID IN PLATELETS CONCENTRATES- RISING DAWN IN ENHANCING BLOOD SAFETY: A TERTIARY HEALTHCARE CENTRE EXPERIENCE

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Background: Efforts to improve the safety of blood banking through enhanced quality assurance processes has been emphasized by National Blood Transfusion Council (NBTC), advocating for stringent quality control strategies. RFID (Radio Frequency Identification) technology offers a shield of safety in this regard. Platelet concentrate management within blood banks enables correct labelling, along with real-time tracking of units. Better inventory management and reduction in wastage of units along with the unique benefit of minimizing errors associated with manual processes makes RFID the next blood safety tool in demand. In this study, we describe our center's experience with respect to newly instated platelet tagging with RFID technology. Methods The data for platelet units tagged and issued during the study period (April 2025-July 2025) was prospectively acquired and analysed. The RFID System (Biolog-ID) employs a radiofrequency enabled RFID tag, integrated with our hospital information system, along with software for tracing the units. RFID tag in the form of a sticker is affixed on the platelet unit's label. The number of clerical errors in platelet units was noted during the study period. Results Out of 7471 whole blood units collected during the study period, 7356 platelets were prepared. Of these 912 units were RFID tagged. The units tagged were subsequently scanned bedside before transfusing. During the study period, 770 (84.4%) were scanned. We observed that there were no clerical errors involving the platelet transfusion throughout the hospital using the RFID tagged units. In addition, for 5 platelet units, near miss events due to manual labelling error were noted (0.13%) Conclusion Our findings demonstrate that the initiation of platelet RFID tagging in our Blood Centre has effectively decimated the errors relating to manual labelling. This enhanced safety tool, if wisely implemented in a phasic manner with simultaneous induction and training of staff can significantly increase the confidence in blood safety for all patients. The authors re-iterate the utility of RFID in substantially smooth working of blood center inventory in terms of traceability, reduced wastage, and efficient supply chain management.

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ANTI G ANTIBODY FORMATION FOLLOWING TRANSFUSION IN A MALE PATIENT : A CASE REPORT

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Background: And AIM The G antigen, of the Rh blood group system, is present on all red blood cells expressing either the D or C antigen but absent when both are lacking. Anti-G can serologically mimic a combination of anti-D and anti-C, potentially leading to misinterpretation. Anti-G formation is well-documented following pregnancy but is rarely reported following transfusion with Rh-positive red blood cells. We report a rare case of a male patient who developed anti-D and anti-G antibodies after receiving Rh-incompatible transfusion during emergency trauma care. CASE REPORT A male patient in his early thirties was admitted to Emergency Department with right tibia fracture following a road traffic accident. A massive transfusion protocol was activated due to significant blood loss. In the pre transfusion workup, the patient was found to be O negative blood group. First 2 units of O negative PRBCs were cross matched and transfused. Thereafter, due to ongoing demand and minimal O negative inventory in the blood centre, O positive units were crossmatched and issued to save the life of the patient. No adverse reactions were reported during or after transfusion. Patient's clinical condition improved and received further treatment in Orthopaedic department for multiple fractures. As per our departmental protocol, the antibody screening was done on day 3 and 7 of transfusion and was found to be negative. Patient was discharged on day 15 and was advised to follow up . Patient was in continuous follow-up under Orthopaedics Department and was re-admitted for corrective surgery for malunion of tibia after 6 months.The blood sample submitted along with the blood requistion form for pre transfusion testing typed 'O' negative and antibody screening was positive.The antibody screening and identification panel were suggestive of anti-D+C±G antibody. Further differential adsorption and elution were performed for G antibody identification. After series of adsorption and elution, the antibody detected was anti-D and anti G. The presence of anti-C was ruled out. Two fully compatible 'O' negative Packed Red Blood Cells ,negative for 'C' antigen were issued and transfused without any adverse reactions. Patient improved clinically and was discharged with advice to follow up. CONCLUSION: To the best of our knowledge, this is the first case of formation of anti G antibody in a male patient following transfusion. This case highlights that anti-G antibody can develop in Rh(D)-negative individuals following transfusion with Rh(D)-positive red blood cells, even in the absence of pregnancy. It underscores the importance of considering anti-G in serological evaluations, especially when anti-D and anti-C are identified together. Further research is needed to assess the clinical significance of anti-G antibodies in blood transfusions and their role in future antibody formation.

PP 117

CLINICAL UTILITY OF LOW-VOLUME PLASMA EXCHANGE IN ACUTE LIVER FAILURE: A TERTIARY CENTRE EXPERIENCE

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Background: Acute liver failure (ALF) is a critical condition characterized by the rapid deterioration of liver function, often leading to multi-organ failure and high mortality rates. Therapeutic plasma exchange (TPE) has emerged as a supportive measure that facilitates the removal of inflammatory mediators and toxins from the circulation. We assessed the efficacy and safety of low-volume plasma exchange (LV-PLEX) as a bridging therapy in ALF patients at a tertiary care hospital. Methodology: We conducted a retrospective observational study over one year (July 2024 to July 2025) involving patients diagnosed with ALF who received LV-PLEX on the Spectra Optia Apheresis System, utilizing a continuous flow centrifugation method. The procedure involved exchanging 0.7 to 1.4 times the total plasma volume per session. The decision to initiate PLEX was made collaboratively by the hepatology and transfusion medicine teams, following the 2023 guidelines of the American Society for Apheresis (ASFA). Data pertaining to patient demographics, liver disease aetiology, number of PLEX sessions, adverse effects, and clinical outcomes were collected. Biochemical parameters, including bilirubin, liver enzymes, INR, creatinine, and sodium levels, were analyzed pre- and post-procedure. The decision to discontinue PLEX was based on achieving clinical stabilization, reflected by improvements in coagulation parameters, biochemical indices, and neurological status. Results: A total of 28 patients underwent LV-PLEX during the study period, with a median age of 41 years. Decompensated chronic liver disease (DCLD) was the most common clinical category (50%, n=14), followed by ACLF (21.4%, n=6) and ALF (14%, n=4). Alcohol-related liver injury was the predominant aetiology (53.5%), while other causes included viral hepatitis, autoimmune hepatitis, drug-induced liver injury, and sickle cell hepatopathy. Across all patients, 63 PLEX sessions were performed. The median number of sessions was 3 (range 2–4), with an average processed plasma volume of 3588 ± 1010.9 ml per session. Replacement fluids comprised fresh frozen plasma (mean 12.6 ± 3 units) and normal saline 0.9% (1.5 ± 0.5 litres). Statistically significant reductions were observed in serum total bilirubin (22.23 ± 8.71 mg/dL to 16.46 ± 7.11 mg/dL, p=0.000), prothrombin time (PT) (34.40 ± 36.29 to 24.30 ± 5.54 seconds, p=0.029), INR (2.50 ± 1.40 to 1.86 ± 0.53, p=0.000), creatinine (1.03 ± 0.72 to 0.89 ± 0.55 mg/dL, p=0.000) and SGOT (242.2 ± 451 451 U/L to 108.61 ± 88.88, p=0.008). MELD (Model for End-Stage Liver Disease) score reduction from pre- to post-procedure was significant (31.12 ± 6.59 to 24.2 ± 4.77, p=0.000). The estimated 90-day mortality risk, as predicted by the MELD score, decreased significantly from 43.5 ± 18.24 to 24.3 ± 13.01 (p = 0.000). Of the 28 patients, 89.28% (25/28) exhibited marked clinical improvement and were discharged in a haemodynamically stable condition; three patients, however, succumbed to the illness. Conclusion: Low-volume plasma exchange is a safe and effective adjunctive therapy in the management of severe liver injury leading to significant improvement in both clinical status and biochemical parameters.

PP 118

"TRACING THE UNSEEN THREATS" - AN ALLOIMMUNISATION PROFILE OF HOSPITALISED PATIENTS AND BLOOD DONORS

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Background: Red cell alloimmunization presents a critical concern in Transfusion Medicine, leading to potential hemolytic transfusion reactions in recipients and risks to the fetus, such as hemolytic disease of the fetus and newborn (HDFN). Understanding its prevalence and specificities is crucial for patient safety. Aim: This study aimed to determine the prevalence and characterize the specificities of red cell alloantibodies among hospitalized patients and the blood donor population at a quaternary care center. Methodology: This retrospective observational study was conducted at KIMSHEALTH, Thiruvananthapuram, from June 2023 to June 2025. The study population included hospitalized patients (undergoing pre-transfusion testing, pregnant mothers, and surgical patients) and all blood donors from the study period. Testing involved the Indirect Antiglobulin Test, with antibody screening using gel card technology (3-cell panel for patients, monocell for donors) and 11-cell antibody identification (Quidel Ortho). Data were collected from hospital software and blood center registers and analyzed using Microsoft Excel. Results: A total of 32,622 antibody screenings were performed on hospitalized patients, with 95 (0.29%) positive screens, of which 68 (0.21% of total screened; 71.6% of positives) had identified alloantibodies. Among 16,109 donor screenings, 18 (0.11%) were positive, and 12 (0.07% of total screened; 66.7% of positives) had identified alloantibodies. In hospitalized patients, the most frequent single specificities were anti-D (19.1%), anti-Leb (11.7%), and anti-M (11.7%); multiple antibodies and antibodies of unknown specificities (AUS) were also identified. Among blood donors, anti-Leb (33.3%) and anti-M (16.6%) were the most commonly identified specificities, with 3 AUS cases also found. Conclusion: Our study identified a low but statistically significant prevalence of red cell alloantibodies within both the hospitalized patient population (0.21%) and among blood donors (0.07%). Specifically, anti-D was the predominant alloantibody in patients, whereas anti-Leb was most frequently encountered in donors. These results underscore the critical necessity of robust and continuous antibody screening and identification protocols. Such measures are paramount for mitigating the challenges Blood Centres may encounter in sourcing compatible blood unit; thereby ensuring transfusion safety and optimizing patient management.

PP 119

DUAL ANTIBODIES (ANTI-INB & ANTI-D) IN PREGNANCY: CHALLENGES IN DIAGNOSIS AND TRANSFUSION MANAGEMENT.

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Background: In prenatal care, detecting maternal antibodies is essential for the mother and fetal safety. Some maternal antibodies target fetal red cells, causing hemolytic disease of fetus and newborn (HDFN). High-frequency red cell antibodies, though rare, pose unique challenges due to their reactivity against antigens found in over 99% of the population. Anti-Indian B (Inb) is a rare alloantibody directed against a high-frequency antigen in the Indian blood group system. Here we present a rare case of an antenatal woman who had anti-Inb along with clinically significant anti-D antibodies, along with the complications involved in creating a transfusion plan for both the mother and the infant. Case Presentation: A 24-year-old woman of second-degree consanguineous marriage, gravida 3 para 2, presented at 19+5 weeks gestation with a history of Rh isoimmunisation and hypothyroidism. Initial immunohematological testing showed blood group as A1 RhD negative with 3+ grade Indirect Antiglobulin Test (IAT) and pan reactivity in 3- and 11-cell antibody panels by column agglutination technology (CAT). The thermal reactivity of the antibody was tested with panel cells, and both IgM and IgG antibodies were present. Crossmatches with multiple A1-negative and O-negative PRBCs were incompatible. Crossmatches with Bombay and cord red cells were positive, ruling out anti-H and anti-I. Family member crossmatches revealed compatibility only with her brother. Further testing at the reference immunohematology laboratory confirmed the presence of anti-Inb and anti-D antibodies. Genotyping and enzyme studies supported the diagnosis. The patient was monitored closely with MCA-PSV Doppler ultrasonography. Antibody titre levels were checked for both Anti-D and Anti-Inb, using the patient's father's red cells(O RhD positive with Inb negative) and O RhD negative cells, respectively. Anti-D titre was 1:16 and Anti-Inb titre was 1:128. At 34 weeks of gestation, MCA-PSV was 1.54 MoM with Anti-D titre increasing to 1:32, and a decision of termination of pregnancy was taken. Autologous blood was collected from the mother before delivery, and directed blood donation was done by the patient's brother (O RhD negative and Inb negative) and delivered a 2.58Kg male baby by elective cesarean section at 34+3 weeks of gestation. Autologous blood was transfused postoperatively. Cord Blood testing was done. Cord blood group was O RhD positive with DAT positive (4+) and showed the presence of only Anti-D in the plasma. Neonatal jaundice was present, managed by intensive phototherapy, not requiring exchange transfusion, and managed with simple transfusion with the patient's brother's PRBC for anemia correction. Conclusion: This is the first case where another clinically significant antibody (Anti-D) is observed along with Anti-Inb, a high-frequency antibody. Monitoring of MCA-PSV played an essential role in clinical decision-making till the antibody identification was done. In this case, we could do individual titrations for Anti-Inb and Anti-D. Anti-Inb, being IgG in nature, is expected to cross the placenta but is undetected in cord blood. This case highlights the importance of advanced immunohematology techniques and close clinical-transfusion collaboration in managing pregnancies complicated by high-frequency antibodies. Early detection and strategic planning ensure optimal maternal and fetal outcomes.

PP 120

A PROSPECTIVE STUDY OF PREVALENCE, CLINICAL PRESENTATION, MANAGEMENT STRATEGIES AND NEONATAL OUTCOMES OF RH ISOIMMUNISATION IN A FETO-MATERNAL CENTRE IN NORTHERN INDIA

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Author Bio: BACKGROUND AND AIMS Rh isoimmunisation remains a significant cause of Haemolytic Disease of Foetus And Newborn (HDFN), particularly in developing countries with limited access to antenatal anti-D prophylaxis. Despite advancements in preventive strategies, cases continue to contribute to significant intrauterine and postnatal morbidity and mortality. This study aimed to evaluate the prevalence, clinical presentation, management strategies and neonatal outcomes of Rh isoimmunisation in a Tertiary care centre in Northern India . Methodology This prospective observational study was conducted over a period of 12 months in the Department of Transfusion Medicine and feto-maternal centre at a tertiary care hospital from June 2024 to May 2025. Pregnant Rh-negative women with Rh alloantibodies were enrolled and followed antenatally with serial antibody titers and middle cerebral artery peak systolic velocity (MCA-PSV) Doppler studies to monitor fetal anaemia. IUTs were performed when MCA-PSV was >1.5 MoM or fetal hydrops was detected. Postnatally, neonates were evaluated for Haematocrit, total Bilirubin levels and direct Coombs test, with phototherapy or exchange transfusion initiated based on standard guidelines and institutional SOPs. Data on type of antibody, maternal antibody titers, number of IUTs, mode of delivery, gestational age at delivery and neonatal outcomes including need for exchange transfusion, duration of NICU stay, and survival were recorded and analysed. Results Out of 112 Rh-negative antenatal women screened, 27 (24.1%) developed significant alloimmunisation with Rh antibodies. The mean maternal age was 24.8 ± 4.2 years and the mean antibody titre at detection was 1:32. The most commonly detected Rh antibody was Anti-D (n=22), anti-D+anti-C (n=3),anti-c (n=1) and anti-E (n=1). A total of 13 fetuses (48.1%) required serial MCA-PSV monitoring and 6 (22.2 %) underwent IUTs, with an average of 1.6 ± 0.6 transfusions per fetus. Higher gravida pregnancies (Gravida 3 or more) were associated with higher mean titres. The mean gestational age at delivery was 33.8 ± 2.1 weeks and 14.8% of neonates required postnatal exchange transfusion due to severe hyperbilirubinemia. The direct Coombs test was positive in 74.07% of neonates, and the mean peak bilirubin level was 15.6 ± 4.3 mg/dL. The overall survival rate was 92.5%, with one neonatal death attributed to complications of hydrops fetalis and prematurity. The use of MCA-PSV Doppler studies and thorough postnatal monitoring reduced the need for unnecessary IUTs and allowed timely intervention thus improving intrauterine and postnatal outcomes. Conclusion Rh isoimmunisation continues to pose a public health challenge and be a clinically relevant challenge despite prophylactic measures, necessitating diligent antenatal monitoring and early intervention to prevent adverse fetal outcomes. Serial MCA-PSV Doppler surveillance remains an effective non-invasive method for early detection of fetal anaemia and guides the timing of IUTs, reducing morbidity associated with HDFN. Postnatal exchange transfusion remains critical in managing severe hyperbilirubinemia, with a high survival rate when managed promptly. Strengthening anti-D prophylaxis coverage, early detection by judicious and timely screening of Rh negative antenatal cases and establishing algorithms for antenatal and postnatal management are essential for reducing the burden of Rh isoimmunisation in resource-limited settings.

PP 121

ASSESSMENT OF RECALL EFFICIENCY USING A SINGLE-MODE NOTIFICATION STRATEGY AMONG SERO-REACTIVE BLOOD DONORS AT A TERTIARY CARE MEDICAL INSTITUTE IN WESTERN UTTAR PRADESH

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Background: Transfusion-transmissible infection (TTI) screening is a cornerstone of safe blood transfusion practice. As per national policy, donors reactive to any TTI markers must be notified and recalled for post-donation counselling and referred to assigned appropriate centres for confirmatory testing and management. While previous studies have explored dual-mode notification and repeated follow up protocols, our study uniquely focuses on the efficacy of a single-mode telephonic notification protocol, analyzing the associated factors influencing donor response. The aim of this study is to evaluate the impact of single mode notification protocol and its impact on TTI reactive donor response rates. Materials and Methods: This was a retrospective, single centre based observational study conducted from June 1, 2023 to July 31, 2024, at a tertiary care institute in the Rohilkhand region. Blood donors who were found reactive for any TTI—namely HIV, HBsAg, HCV, syphilis, or malaria—were notified through three consecutive telephonic attempts. Donors who responded were counselled in-person and referred for further confirmatory testing and management. Key variables such as age, gender, donor type (voluntary vs replacement), and residence (urban vs rural), were analyzed to identify trends influencing donor compliance. Results: Out of the total 285 sero-reactive donors, only 30 (10.52%) reported to the blood centre, which is considerably lower than the response rates documented in various national studies. Telephonic notification yielded a response from 121 donors (42.45%), among whom 119 individuals (98.34%) consented to visit the blood centre for face-to-face counselling. However, only 30 donors (25.21% of those who agreed) ultimately reported for counselling. When analyzed by donor type, replacement donors demonstrated a higher reporting rate (11.3%) compared to voluntary donors, who showed no response. Donors from rural areas had a slightly better turnout (33.33%) than their urban counterparts (25%). Gender-based analysis indicated a minor difference, with 25.21% of male donors and 25% of female donors reporting for counselling. Age-wise, donors aged ≤40 years showed a higher response rate (11.49%) than those above 40 years. The overall response among reactive donors was 11.32% for replacement donors. Rural donors responded at a rate of 11.2%, marginally surpassing the 10.5% response from urban donors. Female donors showed a notably higher response rate (20%) compared to male donors (10.35%).Notably, all responses occurred after the first call, emphasizing the effectiveness of early contact. Conclusions: The study indicates that a single-mode telephonic notification results in a suboptimal donor return rate. Factors like age, donor type, and locality notably impact recall success. Common reasons for non-response included unreachable numbers, call restrictions, and switched-off phones. The findings emphasize the need for policy revision, incorporating written or digital communication and improved pre-donation counselling to boost donor awareness and compliance.

PP 122

THERAPEUTIC PLASMA EXCHANGE AS AN ADJUVANT THERAPY IN LIVER DISEASE-ASSOCIATED HAEMOPHAGOCYTIC LYMPHOHISTOCYTOSIS

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Background: Hemophagocytic lymphohistiocytosis (HLH) is an uncommon disorder characterized by immune dysregulation, with an incidence of around one in a million population. Mortality rate in patients with HLH approaches around 50%. In such patients, disease activity can be suppressed through cytokine removal by therapeutic plasma exchange (TPE). HLH is a Category III indication for TPE as per American Society for Apheresis 2023 recommendation. To the best of our knowledge, this is the first case series of 15 patients with Liver disease-associated HLH. This study aimed to evaluate the effects of TPE in HLH patients. Methods: This is a retrospective study conducted at a tertiary care Liver Centre in northern India from October 2016 to November 2023. The diagnosis of HLH was based on the HLH-2004 criteria. Data were collected from TPE record files. It included patient's age, gender, primary disease, clinical and laboratory data, TPE procedure details and patient outcomes. TPE was performed on Spectra Optia using FFP as replacement fluid to exchange 1 to 2 plasma volumes per session. Primary outcome measures were changes in serum ferritin levels, cytopenia and other laboratory parameters along with symptomatic improvement. Results: Fifty TPE procedures were done on 15 patients, and a mean 1.59 plasma volumes was exchanged per procedure. Median age was 14 years (9, 28), and 12/15 (80%) were males. All patients had fever, Hyperferritinemia, cytopenia and hepatosplenomegaly. Bone marrow aspiration was done in 13 patients and showed haemophagocytsis in 10 patients. Mean serum Ferritin was 26753.39 µg/L. Serum Fibrinogen was below ≤150 mg/dL in 8 out of 13 (60.2%), and Serum Triglyceride was above ≥177 mg/dL in 8 out of 11 (72.7%) patients. Serum Ferritin, Serum Bilirubin, TLC and platelets were decreased significantly (p < 0.05) with TPE. One plasma volume exchanged led to a 1.4 log reduction in Ferritin levels, which is one of the key markers of mortality in HLH. Complications were observed during six procedures; three patients developed hypotension, two developed rashes, and one had catheter blockage, all were managed uneventfully. A 28-day survival was seen in 86.7% (13/15) of the patients who underwent TPE as an adjuvant therapy. Conclusions: TPE demonstrates promising efficacy as an adjuvant therapy in HLH, significantly reducing hyperferritinemia and improving symptoms. These findings suggest TPE can serve as a valuable bridge to definitive therapy for HLH patients. Further corroboration through randomized controlled trials is warranted.

PP 123

Optimizing Transfusion Strategies in Liver Transplantation: A Retrospective Review of ROTEM-Guided Haemostatic Management

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Background: Haemostatic balance in patients with liver disease is a delicate interplay between diminished procoagulant and anticoagulant forces. Traditional coagulation tests such as prothrombin time (PT), international normalized ratio (INR), and platelet count often fall short in predicting bleeding risk in cirrhotic patients, historically misclassified as hypo coagulable. In contrast, rotational thermoelectrometry (ROTEM), a point-of-care viscoelastic assay, offers a comprehensive, real-time evaluation of the coagulation cascade—including thrombin generation, clot formation, stabilization, and fibrinolysis. In liver transplantation, ROTEM-guided transfusion protocols enable personalized haemostatic interventions, minimizing unnecessary blood product use and enhancing patient outcomes. Aim: To assess the efficacy of ROTEM-based transfusion guidance in liver transplantation compared to conventional coagulation parameters (PT/INR and platelet count) in optimizing blood product utilization. Methods: A retrospective observational study was conducted from February 2023 to July 2025 at a tertiary care center. Eighteen patients who underwent liver transplantation were included. Intraoperative ROTEM analysis was performed alongside conventional coagulation testing at key surgical phases: baseline, anhepatic phase, reperfusion (neohepatic) phase, and prior to ICU transfer. Transfusion decisions were based on specific ROTEM thresholds: CT-EXTEM > 80 seconds or INR > 1.5: Indicative of clotting factor deficiency; Fresh Frozen Plasma (FFP) administered. A5-EXTEM < 25 mm with A5-FIBTEM > 8 mm or Platelet count < 50,000/µL: Indicative of platelet dysfunction; Single Donor Platelets (SDP) transfused. The quantity and types of blood products administered were analyzed. Results: ROTEM-based transfusion protocols were successfully applied in all cases. Median intraoperative transfusion requirements were: Packed RBCs: 3 units FFP: 3 units Cryoprecipitate: 2 units SDP: 1 unit Compared to standard transfusion triggers, ROTEM-guided management led to a notable reduction in FFP and platelet usage without any increase in perioperative bleeding or complications. ROTEM parameters enabled rapid, phase-specific correction of coagulation deficits, improving transfusion precision and timeliness. Conclusion: ROTEM-guided haemostatic monitoring during liver transplantation offers a dynamic and individualized approach to transfusion therapy. This study underscores the potential of ROTEM to refine blood product utilization, enhance patient safety, and support cost-effective transfusion practices. While further prospective studies with control arms are warranted, our findings highlight the clinical value of integrating viscoelastic testing into perioperative bleeding management protocols in liver transplant recipients.

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ANTIBODY SCREENING AND IDENTIFICATION IN DONORS AND GENERAL PATIENTS AT A TERTIARY CARE HOSPITAL IN BIHAR, INDIA

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Background: Pre-transfusion testing is critical for ensuring safe blood transfusions, with antibody screening being a cornerstone to detect clinically significant irregular red cell antibodies. These antibodies, if undetected, can lead to severe adverse transfusion reactions, including hemolytic transfusion reactions (HTRs), and can complicate subsequent transfusions. In resource-limited settings like Bihar, India, where the burden of transfusion-dependent conditions is significant, comprehensive antibody screening and identification are paramount but often face infrastructural and financial constraints. This abstract outlines a study aimed at assessing the prevalence and specificities of irregular red cell antibodies in both blood donors and general patient populations at a tertiary care hospital in Bihar. Background: Irregular red cell antibodies are typically acquired through prior exposure to foreign red cell antigens via transfusion, pregnancy, or transplantation. While routine ABO and Rh(D) typing are standard, the detection of other clinically significant antibodies (e.g., anti-Kell, anti-Duffy, anti-Kidd, anti-MNS) is crucial, as they can cause delayed or immediate HTRs. Data on the prevalence and specific types of these antibodies in the Indian population, particularly in regional settings like Bihar, is scarce. Understanding the local antibody profile is essential for developing effective transfusion strategies, improving patient safety, and managing rare blood group requirements. This study addresses this knowledge gap by providing a localized perspective on antibody prevalence. Methodology: This study employed a cross-sectional design, retrospectively analyzing blood samples from voluntary blood donors and general patients referred for pre-transfusion testing or with a history of transfusion reactions/multiple transfusions, over a specified period (e.g., January 2023 to June 2025). Antibody screening was performed using a three-cell panel (e.g., commercially available O-cells) by indirect antiglobulin test (IAT) utilizing gel technology (Coombs card method) to enhance sensitivity. Samples yielding positive antibody screens underwent further antibody identification using an 11-cell identification panel. Demographic data, transfusion history, and pregnancy history (for female patients) were collected where available. All procedures adhered to standard operating protocols and national blood bank guidelines. Outcome: The study analyzed a total of 23,960 donor samples and 45439 patient samples. Irregular red cell antibodies were detected in 0.02% of donors and 0.00002% of patients. Among the donor population, the most frequently identified antibodies were Anti-Lea while in the patient group, the predominant antibodies were anti-D. A significant proportion of antibodies remained unidentified due to low titer or complex antibody mixtures, particularly in multiply transfused patients. The prevalence of clinically significant antibodies was notably higher in patients with a history of transfusion or pregnancy compared to first-time donors. Conclusion: This study underscores the importance of routine antibody screening and identification in both donor and patient populations at tertiary care hospitals in Bihar, India. The observed prevalence of irregular antibodies, particularly clinically significant ones in patients, necessitates mandatory screening to prevent adverse transfusion reactions and ensure optimal patient outcomes. The findings provide valuable regional data that can inform blood bank policies, guide inventory management for rare blood types, and emphasize the need for advanced immune-hematological services.

PP 125

GENOTYPE–PHENOTYPE CONFLICT IN A H-DEFICIENT PATIENT: A RARE CASE OF NON-SECRETOR GENOTYPE WITH LEWIS B ANTIGEN

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Background: The H-deficient phenotype is an uncommon red cell phenotype caused by mutations in fucosyltransferase genes that regulate H antigen synthesis. These individuals often display weak or absent H antigen expression on red cells despite having functional ABO genes. While most para-Bombay individuals are secretors, genotypically non-secretor para-Bombay cases are extremely rare. In this case, we report an unusual para-Bombay phenotype in a patient who was genotypically a non-secretor. CASE REPORT: A 27-year-old female diagnosed with severe Mitral Stenosis, Tricuspid Regurgitation, Atrial Fibrillation and Congestive Cardiac Failure was scheduled for Double Valve Replacement with Tricuspid Valve Repair. Preoperative blood grouping revealed a type IV discrepancy: forward grouping showed O RhD Positive, while reverse grouping demonstrated 4+ reactions with A, B, and O cells. Anti-H lectin testing was negative by both gel and tube techniques across various temperatures. Antibody screening revealed pan-reactivity with negative Autocontrol and Direct Antiglobulin Test, suggesting the presence of anti-H or anti-IH antibodies. Lewis phenotyping showed a Le(a−b+) phenotype. Anti-H titration revealed both IgM and IgG components, with titres of 8. As the salivary inhibition test could not be performed due to the patient's clinical instability, molecular genotyping was undertaken at the NIIH, Mumbai, which revealed heterozygous mutations in the FUT1 gene and a homozygous non-secretor status in the FUT2 gene, despite the patient exhibiting a Le(b+) phenotype. Surgery was deferred due to the patient's complex medical condition, and she was discharged in a hemodynamically stable state for further evaluation. DISCUSSION: In this patient, molecular genotyping identified heterozygous mutations in the FUT1 gene: c.328G>A (FUT101W.02) and c.725T>G (FUT101N.09). According to the ISBT Working Party, FUT101W.02 is associated with weak H antigen expression, while FUT101N.09 is a null allele, leading to loss of α-1,2-fucosyltransferase activity, explaining the absence of H antigen on red cells. FUT2 genotyping showed a homozygous non-secretor status with four variants: c.171A>G, c.216C>T, c.428G>A, and c.739G>A. Although Le^b antigen expression typically requires a functional FUT2 gene, rare instances exist where non-secretor genotypes still type as Le^b positive. This may occur due to weak or partially functional FUT2 alleles linked to pseudogene formation, allowing minimal type 1H antigen synthesis that serves as a substrate for Le^b production. Another explanation is chimerism or recent transfusion from a secretor; however, the absence of transfusion history in this case rules out that possibility. Additionally, some monoclonal anti-Le^b antibodies recognize a shared epitope between Le^b and Le^y antigens, potentially leading to serologic cross-reactivity and apparent Le^b positivity in FUT2-deficient individuals. CONCLUSION: The identification of FUT1 and FUT2 variants, highlights the genetic diversity underlying rare phenotypes. Molecular genotyping proved essential in resolving the diagnostic conflict in complex or ambiguous serological cases.

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THE SILENT THREAT: A TRUE BOMBAY PHENOTYPE WITH UNEXPECTED TOLERANCE TO O POSITIVE INCIDENTAL TRANSFUSION

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Background: The Bombay (Oh) phenotype is a rare blood group caused by homozygous FUT1 mutations, resulting in the absence of H antigen and development of potent anti-H antibodies. These individuals are compatible only with Oh blood groups. Misidentification, commonly as O blood group, can cause severe hemolysis, highlighting the need for molecular confirmation and rare donor registry support. CASE REPORT: A 35-year-old male presented to a local hospital with three episodes of presence of blood in urine, fever, and dyspnoea. His hemoglobin was 4.8g/dL. A blood grouping report from another laboratory identified him as O RhD Positive, and he was transfused with three units of O RhD Positive PRBCs. The transfusions were initially uneventful, and his hemoglobin rose to 9g/dL. Subsequently, he developed progressive visual loss. He was referred to AIIMS one month later for further evaluation. Blood grouping, Direct Coombs Test (DCT), and Indirect Coombs Test (ICT) were advised. Immunohematological testing revealed a Bombay(Oh) RhD Positive phenotype. Forward grouping showed O RhD positive, while reverse grouping demonstrated panreactivity with A, B, and O cells. There was no reactivity with anti-H lectin. DCT was positive (3+) with IgG monospecificity. Antibody screen was panreactive (4+), with positive Autocontrol (2+). Lewis antigen phenotyping showed Le(a+b−). Salivary inhibition studies confirmed the non-secretor status. Anti-H antibody titres were 4 at room temperature and 16 at AHG phase, indicating clinically significant reactivity. Crossmatch with O RhD Positive PRBCs showed 4+ incompatibility. Due to anticipated transfusion needs, first-degree relatives were tested, but none were Bombay phenotype. Despite the incompatible transfusions, there was no clinical hemolysis or hyperbilirubinemia, raising suspicion. Molecular analysis was pursued and samples sent to NIIH, Mumbai, confirmed classical Bombay phenotype with homozygous FUT1 c.725 T>G mutation (FUT1*01N.09) and FUT2 gene deletion. Further investigations, including bone marrow biopsy and cytogenetics, confirmed Plasma Cell Leukemia. Over 2.5 months, hemoglobin dropped to 4.5 g/dL, and he was admitted with high-grade fever, dyspnoea, severe diarrhoea, and back pain. Due to the unavailability of Bombay PRBCs locally, three compatible units were sourced from another state. Two donors came for donation to the blood centre and a total of five Oh PRBC were found compatible and transfused uneventfully to support the acute phase of illness and subsequent chemotherapy. DISCUSSION: An intriguing aspect of this case was the absence of an acute hemolysis despite transfusion of serologically incompatible red cells. One plausible explanation is initially a low titre of anti-H antibodies, insufficient to trigger an immediate hemolytic response. Further complicating the clinical picture was Plasma Cell Leukemia, known to cause immunological dysregulation. The underlying plasma cell dyscrasia might have contributed to an altered or delayed immune response, masking classical features of hemolysis and delaying recognition of incompatibility. CONCLUSION: Patients with rare phenotypes like Bombay require proactive testing and early molecular confirmation, especially when transfusion dependence is anticipated. Delayed hemolysis may present insidiously and be life-threatening. Collaboration with rare donor registries and timely diagnosis are essential to avoid catastrophic transfusion outcomes.

PP 127

THERAPEUTIC PLASMA EXCHANGE IN LIVER DISEASES: A PROMISING BRIDGING THERAPY WITH NOTABLE TRANSPLANT-FREE SURVIVAL

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Background: Therapeutic plasma exchange (TPE) is a promising therapeutic treatment modality offered to liver disease (LD) patients. The potential benefits of TPE are metabolic detoxification i.e. removal of endotoxins, cytokines and damage associated molecular patterns (DAMPS) followed by replacement with fresh frozen plasma (FFP) alone or in combination with crystalloids. TPE helps to stabilize these patients by improving their liver function and potentially bridging them to liver transplantation (LT). The aim of our study was to analyze the outcome of TPE in our LD patients. Methods: This retrospective observational study was conducted by Department of Transfusion Medicine from January 2023 to June 2025 in LD patients who underwent TPE. Patient demographics, biochemical parameters, TPE procedure details, hospital stay and mortality were retrieved and analyzed. 1 to 1.5 plasma volume exchanges were performed per session in every patient and a combination of crystalloid and FFP was used as replacement fluid. Prophylactically, 10% calcium gluconate infusion was given during TPE to avoid citrate toxicity. Results: Twenty-five LD patients (18 males; 72%; 7 females; 28%) underwent TPE with a mean age of 38.3 ± 12.4 years. Of these, 9 (36%) had acute liver failure, 7 (28%) had decompensated chronic liver disease, 6 (24%) with acute on chronic liver failure, 2 (8%) post-LT graft dysfunction and 1 (4%) patient was admitted due to organophospohorus poisoning. A total of 79 TPEs were performed with an average 3.2 TPE sessions per patient (range 1-5). Statistically significant reduction was noted in total bilirubin (p= 0.003), direct bilirubin (p<0.05), aspartate aminotransferase (AST; p=0.008), alanine aminotransferase (ALT; p=0.007), alkaline phosphatase (ALP; p=0.016), prothrombin time (PT; p=0.018) and international normalized ratio (INR; p=0.016). Significant improvement was noted in the MELD scores post-TPE (p<0.05) and at the time of discharge (p=0.009). No adverse events occurred during and after TPE. The overall survival was 48% (12 patients), while the transplant free survival was 44% (11 patients) until last follow up at least 6 months. One ALF patient was successfully bridged to LT after 10 days of presentation and is alive and doing well (14 months post-LT). Average length of stay (LOS) in our patients was 23 days (range 4-53). In the deceased cohort (13; 52%), LOS less than 14 days was seen in 5 (39%) patients, while LOS more than 28 days in 8 (62%) patients and major cause of death was septic shock with multi-organ failure. Almost all of these patients had refused the option for LT. Conclusion: TPE is a safe and effective therapeutic treatment modality being offered to LD patients with one of the potential benefit being transplant free survival which was 44% in our patients.

PP 128

REACHING THE TARGET STEM CELL DOSE: INSIGHTS FROM A FOUR-ALGORITHM ANALYSIS

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Author Bio: Background With advancements in apheresis technology, peripheral blood stem cell collection (PBSC) has become most common modality to collect stem cells. Researchers have developed various protocols to predict stem cell dose. Present study is done with the aim to evaluate if pre-count-based algorithms are feasible in our set-up or the current practice of performing intra-procedure CD34 counts supersedes the formula-based protocols. Methods Retrospective data of PBSC procedures performed from February 2023 to February 2025 was collected and analyzed. Based on descriptive analysis of pre-CD34 counts (PBCC), CE2, intra-procedure CD34 cell count (InPC), blood volume processed (nTBV) and recipient body weight, 3 predictive algorithms were generated. These algorithms were compared with the current InPC based algorithm. A subgroup analysis of autologous and allogeneic PBSCs was also performed. For the prediction formulae target dose of 5x106CD34+ cells/Kg for autologous, 10x106/Kg for allogeneic and 7.5x106/Kg average dose for combined evaluation was used. Dose prediction formula compared predicted dose with actual stem cell dose collected. Product volume to be collected to achieve target dose was compared in intra-procedural count-based formula with actual volume collected providing target dose. CE2 and regression equation-based algorithms evaluated correlation with predicted number of blood volume to be processed to get target dose and actual blood volume processed to get target dose. Results 41 PBSC procedures (31 allogeneic and 10 autologous) were included in the study. Median age (range) of donors was 30 years (5 to 64 years), weight 54 Kg (17-110 Kgs), TBV 3.7(3.1-4.6) litres and median (IQR) PBCC 84(53-136) cells/µL. The median (IQR) procedure parameters were InPC 2610(1224-3711) CD34+ cells/µL, Intra-procedure yield [InPY] 5(2.4-8.1) x106/Kg, final nTBV 2.63(2.19-3.53), final product yield [FPY] 11(7.28-16.4) X106 CD34+ cells/Kg, Product volume (PV) 190(159-235) ml and Collection efficiency (CE2) of 50.8% (42.3-68) %. A weak correlation (r=0.456, p 0.003) of CE2 with final product cell count was observed whereas in subgroup analysis, moderate correlation in autologous PBSCs was observed (r=0.745, p=0.018). CCPB correlated well with FPY obtained (r=0.603, p<0.001), InPY (r=0.479, p=0.002), FPY per ml blood processed (r=0.621, p<0.001) and inversely related to nTBV (r=-0.385, p=0.013). Among the predictive algorithms, formula-based dose prediction algorithm correlated strongly with the target dose required for both autologous and allogeneic PBSCs (r=0.9, p=0.003 and r=0.734, p=0 respectively). When the correlation was drawn with the results of predictive algorithms and actual procedure values sufficient to achieve target dose, InPC based protocol gave strongest correlation (r=0.944, p=0) followed by CE2 based protocol (r=0.852, p=0) and regression equation-based protocol (r=0.634, p<0.001). Similar trend was also observed in subgroup analysis. Conclusions Intra-procedure count based algorithm provides the most accurate prediction of product volume to be collected to achieve the target dose but has limitation of being costlier and the time taken for report to be available leading to over collection of stem cell product in some cases. Alternatively, based on center's historical data, individualized dose prediction or CE2 based algorithm can be derived and utilized efficiently.

PP 129

RH ANTIGEN AND PHENOTYPE PATTERNS: IMPLICATIONS FOR EXTENDED TYPING IN TRANSFUSION PRACTICE-A RETROSPECTIVE OBSERVATIONAL STUDY

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Background: The Rh blood group system is the second most clinically significant blood group system after ABO, comprising over 50 antigens. Among these, the five principal antigens — D, C, c, E, and e — are particularly important in transfusion medicine. Rh antigens are known for their high immunogenic potential, especially the D antigen, which can readily induce alloimmunization in Rh-negative individuals exposed to Rh-positive blood. Extended Rh antigen typing becomes essential in multi-transfused patients, such as those with thalassemia or sickle cell disease, where repeated antigenic exposure increases the risk of alloimmunization, leading to hemolytic transfusion reactions or delayed hemolysis. Additionally, awareness of antigen and phenotype frequencies within specific populations supports transfusion planning, aids in selecting antigen-negative donor units for sensitized patients, and plays a role in population genetics, disease association studies, and forensic applications. Aim To assess the clinical relevance of extended Rh phenotyping in various transfusion-dependent hematological conditions and to analyze the distribution of major Rh antigens and phenotypes in a local donor and patient population. Materials and Methods A retrospective cross-sectional study was carried out at the Department of Transfusion Medicine, Nizam's Institute of Medical Sciences, from January 2025 to June 2025. The study included 202 subjects — both voluntary blood donors and transfusion-dependent patients with hematological disorders. Patients included those diagnosed with thalassemia, sickle cell disease, autoimmune hemolytic anemia (AIHA), Evans syndrome, hemolytic disease of the newborn (HDN), aplastic anemia, von Willebrand disease, and lymphoproliferative disorders. Both first-time transfusion recipients and previously transfused individuals were included. Rh and Kell antigen typing was performed using the Column Agglutination Technology (CAT), and ABO grouping was done in parallel. Descriptive statistical methods were applied to evaluate antigen and phenotype distributions. Results Among the 202 individuals tested, the most frequently observed Rh antigen was e, present in 96.5% of the population, followed by C (88.6%), c (44.1%), and E (13.9%). The Kell (K) antigen was least common, found in only 4% of cases. The most common phenotype among Rh-D positive individuals was DCe/DCe (Ce), seen in 76.5% of cases. Among Rh-D negative individuals, the predominant phenotype was ce/ce, observed in 83.3%. ABO blood group distribution revealed Group O as the most prevalent (54.5%), followed by Group B (28.2%) and Group A (16.8%).Phenotypic distribution within clinical subgroups revealed Ce as the dominant phenotype in AIHA (66.7%), aplastic anemia (50%), sickle cell disease (50%), and thalassemia (100%). The ce phenotype predominated in lymphoproliferative disorders (100%) and was also noted in 25% of sickle cell patients. Less frequent phenotypes included ceK, Cce, and cEeK. Conclusion The study's findings align with existing Indian data, confirming e antigen and DCe/DCe phenotype as most common. Local antigen frequency data can enhance transfusion safety by aiding in the identification of compatible antigen-negative units for alloimmunized patients. Extended Rh typing proves valuable in transfusion planning, especially in chronically transfused populations, reducing the risk of alloimmunization and improving overall transfusion outcomes.

PP 130

Influence of Pre-Donation Haematocrit and Platelet Count on Plateletpheresis Duration: A Retrospective Analysis

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Background: Plateletpheresis allows for the targeted collection of platelets from a single donor while returning other blood components, offering distinct advantages such as higher yield, improved storage, and reduced risks of transfusion-transmitted infections and alloimmunisation. Understanding donor-related factors that influence the efficiency of the procedure can enhance donor safety and optimize resource utilization. Aim: To evaluate the impact of pre-donation haematocrit (HCT) and platelet count on the duration of plateletpheresis. Methods: A retrospective study was conducted at the Department of Transfusion Medicine, Rajiv Gandhi Government General Hospital, Chennai, from January to June 2025. Donors were categorized based on haematocrit values: Group A (>45%) and Group B (≤45%). Additionally, based on platelet counts, Group C (<2.5 lakh/µL) and Group D (≥2.5 lakh/µL) were compared. Data were analysed to assess the relationship of these variables with the duration of the apheresis procedure. Results: Among 176 donors, 59 belonged to Group A and 117 to Group B. Haematocrit levels showed no statistically significant effect on procedure duration (p=0.711). However, platelet count had a significant influence: donors in Group D (117) donors) experienced a notably shorter procedure time compared to Group C (62 donors) The duration of plateletpheresis significantly decreased in donors with higher platelet count (p<0.001). Conclusion: While haematocrit levels did not significantly affect the duration of plateletpheresis, a higher pre-donation platelet count was associated with reduced procedure time. Selecting donors with higher platelet counts may contribute to greater procedural efficiency and improved donor comfort.

PP 131

THE SPECTRUM OF MATERNAL RED CELL ALLOANTIBODIES CAUSING HEMOLYTIC DISEASE OF THE FETUS AND NEWBORN : FROM ANTI-D TO RARE ALLOANTIBODIES

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Background: Hemolytic disease of the fetus and newborn (HDFN) is a clinical condition that occurs as a result of hemolysis of fetal or neonatal red blood cells (RBCs) due to maternal red cell antibodies that can cross the placenta. Anti-D being the most prevalent alloantibody implicated in HDFN, several other RBC alloantibodies like anti-c, anti-E, and anti-Kell, anti-C, e, Kidd, Duffy, and MNS blood group antibodies, can lead to fatal HDFN. Factors influencing RBC alloimmunization in pregnancy are previous transfusions, parity, fetomaternal haemorrhage, previous pregnancies, obstetric procedures like amniocentesis and Rh-D status. Overall prevalence of red blood cell alloantibodies in pregnant women ranges between 1 % and 2 % as published in different studies of many different developed and developing countries. ABO HDFN is largely limited to maternal blood group O having a newborn with blood group A or B or AB, due to the occurrence of IgG type of anti-A or anti-B antibodies in group O mothers. Aim and Objectives To detect the underlying antibody (ABO or alloantibody) in neonates with clinical features suggestive of HDFN. To evaluate the relationship of factors like maternal age, parity, blood group, antibody specificity and treatment options with the clinical outcome. Materials and Methods This study was done at department of Transfusion Medicine at a tertiary care hospital in Hyderabad, India. Data was collected retrospectively for a period of eight years i.e., from 2017 to 2024. Blood grouping of mother and neonate were done with Diaclon-ABO/D + Reverse grouping. Direct Coomb's test and Indirect Coomb's test were done with both mother and neonate's sample. Antibody screening was performed using 3 cell panel (ID-DiaCell I,II,III). Samples with positive antibody screening were analyzed further for antibody identification using 11 cell panel (Set ID-Dia Panel). Results A total of 408 patients with neonatal jaundice (NNJ) came for HDFN workup. HDFN was confirmed in 140 neonates. Among all neonates male babies were slightly high in number i.e.218 (53.4 %) were males and 190 (46.5 %) were females Among all the mothers, majority of them were multigravida (79 %). Primigravida mothers were only 8 (5.7%) in HDFN group compared to 76 (28.3%) in non-HDFN group, which was also statistically significant finding between two groups ($p < 0.01$).When HDFN was due to alloantibody, its identification was done. The specificities of alloantibodies are Anti-D 57 (53.3 %) Anti-D + anti-C 22 (20.5 %) Anti-c 12 (11.2 %) Anti-E 8 (7.5 %) Anti-c + anti-E 4 (3.7 %). Comparison of parameters was done between Alloantibody mediated HDFN and ABO incompatible HDFN showed Multigravida104 (97.2 %) History of Previous transfusions9 (8.4 %) Bad obstetric history40 (37.4 %) Rh neg75 (70.1 %) Conclusion Anti-D remains the most common alloantibody causing HDFN. This study highlighted the importance of screening for RBC alloantibodies in all pregnant women irrespective of their RhD status, as Rh-positive mothers also had developed alloantibodies causing HDFN and ABO HDFN.

PP 132

BLOOD GROUPING WITH ABD PAD- EFFICACY AND COMPARISON WITH STANDARD METHOD.

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Background: In transfusion service, it is very important to carry out blood group with perfection. There are many methods for performing grouping like conventional test tube method, column agglutination method, erythrocyte Magnetised technique. Test tube method is gold standard method for blood grouping. To ensure accurate verification of a donor's blood group—whether at a blood centre, camp site, or bedside during emergency transfusions—we require the results of the patient's blood grouping. The ABD PAD® is a new device designed for rapid confirmation of the ABO and RhD blood groups. It offers a quick and reliable method to verify blood type in blood centres, especially during urgent situations. Material and Methods: Blood grouping was performed on 1,000 samples—207 from donors and 793 from patients—using the ABD PAD system. The results were compared with those obtained from the conventional tube technique and an automated platform. By EMT method All 1000 tests performed on the ABO PAD were concordant with other standard methods, namely test-tube technique and automated platform erythrocyte Magnetised technique (EMT). The results of ABD PAD were quicker (within 30 seconds) and easy to interpret. Result: All 1000 tests performed on the ABD PAD were concordant with other standard methods, namely the test tube technique and EMT. The results of ABD PAD were quick (within 30 seconds) and easy to interpret. Two subgroups of A also detected among patient. Discussion: The manual confirmation of the ABD group and RH method is Realtime and time-consuming task. It requires following a procedure pending several reactions in this system. The ABD pad is a ready-to-use device using the Latex Technology M-TRAP, facilitating the procedure intended for the confirmation of ABO/Rh. The only drawback is that we are not able to perform reverse grouping. Conclusion: ABD PAD is very useful for blood grouping in donors in the blood centre as well as in outdoor blood donation camp since the blood type of blood unit when we want to re-check the blood group of the donor bag it is easy to interpret, fast, reliable and results are comparable with standard methods.

PP 133

ANALYSIS OF BLOOD DONOR DEFERRAL CAUSES EXCLUDING HEMOGLOBIN-RELATED CRITERIA

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Background: Blood donor deferral is essential to ensure both donor health and recipient safety. Established eligibility policies are routinely reviewed to reflect emerging evidence and evolving needs. Frequent deferrals can deter repeat donations, so optimizing criteria based on data-driven insights is vital for balancing blood safety with donor retention. Aims To analyse the pattern and underlying causes of donor and to propose practical, evidence-based strategies aimed at retaining eligible donors and optimizing donor recruitment and retention. Objectives: This study aimed to evaluate the incidence and underlying causes of blood donor deferrals in a tertiary care hospital over a one year period. 1 Quantify Deferral Rate & Demographics 2 Analyze Common Deferral Causes 3 Recommend Strategic Interventions Methods We conducted a retrospective chart review of all donor at nizams institute of medical sciences, deferrals from June 2024 to June 2025. Deferrals were classified as temporary (e.g., upper respiratory symptoms, open wounds, minor allergies, fasting) or permanent (e.g., underage < 18, tattoos, sustained hypertension, chronic illness). We calculated overall deferral rate, proportions of temporary versus permanent deferrals, and frequency of specific reasons. Demographics were analyzed for age, gender, and weight distributions. Results Between June 2024 and June 2025, 3.6% (535/15,000) of donor candidates were deferred. Of these, 75% were temporary deferrals—typically minor issues like colds or skin conditions—while 25% were permanent (e.g., underage, hypertension, tattoos). Key causes: respiratory issues (35%), skin problems (20%), tattoos (10%), hypertension (8%), and underage donors (7%). Most deferred donors were male and roughly 28 years old on average. Conclusion Most donor deferrals in our study were temporary, caused by minor and reversible issues like colds and skin conditions. These present a prime opportunity for re-engagement through targeted education, counselling, and follow-up. Permanent deferrals are vital for safety but should be communicated clearly to maintain trust. Ongoing monitoring of deferral trends allows data-driven policy refinement and better resource allocation—boosting donor retention and ensuring a safe and sustainable blood supply.

PP 134

TRIGGERS OF RED CELL TRANSFUSIONS IN A TERTIARY CARE HOSPITAL : A RETROSPECTIVE OBSERVATIONAL STUDY

Authors:

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Author Bio: Title:Triggers of Red cell Transfusions in a Tertiary Care Hospital : A Retrospective Observational Study Authors : Dr. R.Rajanish 1st year junior resident, IHBT Dr. B. Shanthi, Professor , IHBT Dr. V.Sudhir Kumar, Addl professor and HOD, IHBT Dr. K. Mahesh Kumar ,Associate Professor , IHBT Background: PRBC transfusion has emerged as an integral part of patient care. Most clinical practice guidelines recommend restrictive red cell transfusion practices, with goal of minimising exposure of Allogenic blood. However, studies reveal frequent inappropriate use. This study examines PRBC triggers and appropriateness in tertiary care Hospital. Aims and Objectives: To examine the Transfusion thresholds in a Tertiary Care Hospital using Hb and Hct as parameters. Materials and Methods: This retrospective observational study was conducted in the Department of Transfusion medicine at tertiary care teaching hospital from 1st February 2025- 30th June 2025. Data of 2500 critically ill patients who received red cell transfusions were collected from Bloodcentre records. Parameters included patient Hb and Hct levels, diagnoses, number of PRBC's units transfused. Appropriateness of transfusion was assessed using AABB guidelines. Inclusion criteria: patients who received PRBC's during hospitalization,availability of pre and post-Hb and Hct values. Exclusion criteria: patients with Sepsis. Outcome: A total of 2143 units of PRBC's were transfused across 2500 critically ill patients. The Hb and HCT values for Cardiothoracic Surgery were(10.3,31.4), for Nephrology (6.3,22.7), for Emergency Medicine (7.3, 31.9), for Surgical Gastroenterology (9.3,35.6), for Medical Oncology (7.5,21.3), for Orthopedics (8.2,34.3), for General Medicine (8.9,25.7), for Neurosurgery (8.4,27.2). Hb and HCT values post transfusion for Cardiothoracic Surgery were(10.6,32.5),for Nephrology (6.9,24..5),for Emergency Medicine (8.2, 34.7),for Medical Oncology (7.8,23.4),for Orthopedics (8.4,36.6),for General Medicine (9.3,27.4),for Neurosurgery (8.8,29.4). · Conclusion: This study highlights substantial PRBC usage in critically ill patients, with notable interdepartmental variations. While restrictive transfusion strategies are recommended, they may not account for specificity of patient's requirements.Unwarranted use posed risks like TRALI and resource strain. Regular clinician education, and implementation of transfusion audits help in better red cell usage. Promoting rational PRBC use will enhance patient safety, optimize outcomes, and preserve precious blood components.

PP 135

EFFICACY AND SAFETY OF GRANULOCYTE TRANSFUSION THERAPY IN NEUTROPENIC PATIENTS WITH REFRACTORY INFECTIONS: A PROSPECTIVE STUDY

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Background: Severe neutropenia remains a significant risk factor for life-threatening infections, particularly in patients undergoing chemotherapy, hematopoietic stem cell transplantation, or those with congenital neutropenia. Despite advances in antimicrobial therapies and hematopoietic growth factors, some patients develop infections that are unresponsive to standard treatments, resulting in high morbidity and mortality. Granulocyte transfusion therapy (GTT) has been explored for decades as an adjunctive measure to bridge patients through periods of profound neutropenia. However, evidence regarding its clinical efficacy, optimal dosing, donor mobilization strategies, and safety profile remains inconclusive and varies widely across centers. This study aimed to evaluate the clinical efficacy, feasibility, and safety of granulocyte transfusions in neutropenic patients with documented, refractory infections. Methodology: A prospective, single-center study was conducted over 12 months, enrolling 20 neutropenic patients (absolute neutrophil count <0.5 × 10/L) with microbiologically proven bacterial or fungal infections unresponsive to broad-spectrum antimicrobials for at least 72 hours. Donors were healthy volunteers mobilized with granulocyte colony-stimulating factor (G-CSF, 5 µg/kg) and dexamethasone (8 mg) administered 12 hours prior to leukapheresis. Granulocyte concentrates were collected via continuous-flow apheresis and transfused within 6 hours of collection. Each patient received a median of 4 transfusions (range: 2–8) on alternate days. Efficacy was assessed by clinical response, resolution of fever, microbiological clearance, neutrophil increments post-transfusion, and overall survival at 30 days post-therapy. Adverse reactions were monitored during and after transfusion. Results: Of the 20 patients, 14 (70%) demonstrated clinical improvement, with defervescence occurring within a median of 3 days from the first transfusion. Microbiological eradication of the causative pathogen was confirmed in 08 patients (40%). The mean post-transfusion neutrophil increment was 1.2 × 10/L per transfusion, sustaining for an average of 18–24 hours. The 30-day overall survival rate in responders was 75%, compared to 25% in non-responders ($p < 0.05$). Adverse reactions occurred in 2 patients (10%), including mild febrile reactions and transient pulmonary complications (1 case); no severe transfusion-related acute lung injury (TRALI) or alloimmunization was observed during the study period. Donor mobilization was well tolerated, with no significant side effects. Conclusion: Granulocyte transfusion therapy appears to be a feasible and beneficial adjunct in managing severe infections in neutropenic patients unresponsive to conventional therapy. The use of G-CSF and dexamethasone-mobilized donors resulted in satisfactory granulocyte yields, adequate neutrophil increments, and acceptable safety profiles. While the clinical response and survival benefits observed are encouraging, the transient nature of neutrophil increments highlights the importance of repeated dosing and timely administration. Larger, randomized controlled trials are warranted to standardize protocols, optimize donor mobilization, determine patient selection criteria, and further establish the therapeutic role of GTT in the era of modern antimicrobial and supportive care. Until then, granulocyte transfusions should be considered as a supportive bridge in select high-risk patients with persistent, life-threatening infections.

PP 136

ROOT CAUSE ANALYSIS OF BLOOD DISCARD DUE TO BLOOD COLLECTION FAILURE

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Background: Blood Collection failure has an adverse impact on donor experience and return rate. This also negatively impacts blood component preparation and quality of blood units. Objectives: The objective of this study was to do root cause analysis of blood discarded due to failure in blood collection. Methods: This one year retrospective study was conducted by collecting and analyzing records of all collection failures with regard to the causes, level of staff responsible, donor characteristics. Results: A total of 49 collection failures out of 2401 donations (2.04%) were recorded during this period. The leading cause was due to adverse donor reactions 30.6 % followed by double prick 20.4%. collection failures due to haematoma at vene puncture site 18.36%. Equipment failure 4.08%. Less volume collected 22.4 %. Increased time of collection and hence clot 5.1 %. Newly recruited Junior Residents were responsible for majority of failures followed by newly posted Nursing staff. Higher frequency of all collection failure was seen in female donors due to increased donor reactions and thin veins. Conclusion: Root cause analysis of collection failure plays a pivotal role in establishing preventive measures to improve quality and decrease discard rate.

Past Triumphs & Future Horizons
TRANSCON 2025

PP 137

IS HEMOGLOBIN CONTENT A BETTER QUALITY PARAMETER THAN VOLUME FOR RED CELL UNITS?

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Background: The current QC criterion for RBC components includes volume of the unit as an essential parameter. There is a lot of variability in the donor Hemoglobin, haematocrit and volume of the component prepared. We aim to evaluate if total haemoglobin content of the RBC unit proves to be a better quality parameter as compared to RBC volume. Methods: Quality control parameters of 143 PRBC units prepared from 450 ml whole blood collection in top and bottom bags with in-line leucodepletion filters and100 PRBC units prepared from 350 ml WB collection in top and bottom bags were retrieved and total Hb content was calculated for each unit after considering the respective donor Hb level. The QC criteria specified in the third edition of NABH standards for blood centres was considered as standard reference. The number of units failing the volume criterion but still passing the Hb content criterion were noted. Statistical analysis including paired t test, pearsons correlation coefficient and Regression analysis was done. Results: 25/143 (17.48%) RBC units prepared from 450 ml collections and 13/100 (13%) RBC units prepared from 350 ml collections failed the volume criterion. However, 24/25 RBC units prepared from 450 ml collections qualified the total Hb criterion of 40 gm per unit. None of the 13 RBC units prepared from 350 ml collections qualified the Hb content criterion of 43 gm per unit. The average Hb content of these RBC units was 35 gm. Conclusion: Hb content of RBC units may prove to be a much more robust and relevant QC parameter as compared to volume of the unit, especially in case of RBC units prepared from 450 ml whole blood.

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PP 138

IMPACT OF REVISED DONOR SELECTION GUIDELINES (NBTC, 2025) ON DEFERRAL PATTERN IN WHOLE BLOOD DONOR POOL – A SINGLE CENTRE STUDY IN NORTH INDIA

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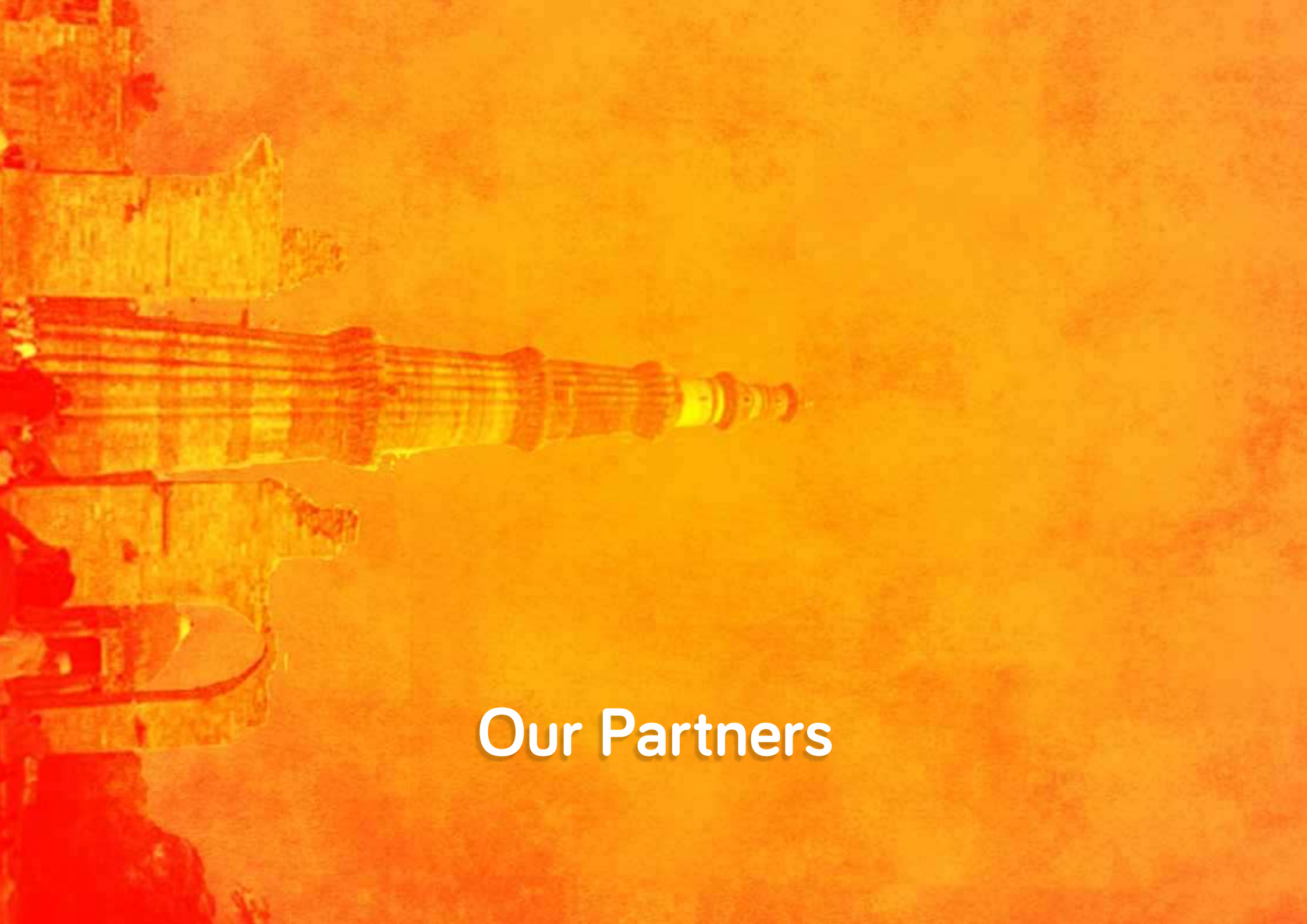
Background: Blood is an essential resource in medical treatment and emergency care, with an estimated annual demand for blood in the country estimated at 14.6 million units. To promote voluntary non-remunerated donations through a well-coordinated and networked blood transfusion service, the 33rd Governing Body Meeting of the National Blood Transfusion Council (NBTC) was convened on November 19, 2024. During this meeting, the donor selection and referral criteria guidelines were revised and subsequently published on January 25, 2025.This study aimed to evaluate the extent to which these new guidelines expand the donor pool. Methodology: The study was conducted over a period of 6 months from January 2025 to June 2025 in a tertiary care hospital. The newly introduced guidelines have implemented significant modifications that affect the donor selection and deferral processes. These changes not only include the acceptance of donors with haemoglobin levels up to 18.5 g/dL in males and 16.5 g/dL in females but also reduced the deferral period for dental procedures ranging from 48 hrs to 2 years, additionally acceptance of donors in a euthyroid state on medication, and inclusion of stable asthma patients on inhaled steroids. Result: During the study period of 6 months, a total of 12542 donors were screened, out of which 780(6.2%) donors were deferred. Of these, 528(67%) were males and 252(33%) were females. Out of the total deferred, 264(33.8%) donors would have been included as per the implementation of new guidelines. The mean number of donors deferred per month for high hemoglobin levels (17-18.5 g/dL) is 21 ± 7.2. The mean number of donors deferred per month due to dental procedures and minor surgeries is 5.5 ± 1.6 and 3.6 ± 1.5 respectively. The average number of donors on thyroid medication but in a euthyroid state is 10 ± 1.9 per month. Additionally, asthmatic donors deferred due to the use of inhaled steroids average 2.8 ± 1.3 per month. Conclusion The new guidelines have made a positive impact on the donor pool allowing an increase in inventory and better resource allocation and stock management. Because of the clarity provided in the new selection criteria more donors can be included in the donor pool, which is significant in our country with limited donors.



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