Attendance Report

International Society of Blood Transfusion (ISBT)
International Congress 2024

Co-funded by the European Union

WP5 / T5.1 : Participation of TIF Experts In Scientific Conferences

The Thalassaemia International Federation (TIF), represented by Dr. Constantina Politis, PhD, Emeritus Professor of Medicine at the National and Kapodistrian University of Athens, participated in the International Society of Blood Transfusion (ISBT) conference in Barcelona, Spain, from June 23-27, 2024.

NOTE:
More information on any of the topics in this report is available upon request:
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Sessions and Highlights

Therapeutic Advances and Blood Management: Professor Politis attended sessions covering new therapeutic approaches, blood banking, patient blood management, and industry-led Satellite Symposia. These sessions focused on advancing solutions for plasticizers in the blood transfusion environment, improving methodologies for pathogen inactivation, and recommending processing and storing erythrocytes under hypoxic conditions.

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Artificial Intelligence and Big Data: A key interest was the discussions on Artificial Intelligence (AI), Big Data, and other innovations related to gene therapies and transplants, which offer new hope for curing patients with Thalassaemia and Sickle Cell Disease.

Haemovigilance and Regulatory Compliance: Engagement with specialists in haemovigilance and traceability provided insights into compliance with the new European regulation for Blood and Other Substances of Human Origin (SoHOs). Collaborative efforts also included working group exchanges on blood group genomics and regulatory mechanisms.

Climate Change Impact: Presentations on the last day highlighted the impact of climate change on transfusion medicine and the quality of life for transfusion-dependent individuals globally.

Key Workshops and Discussions

1. Blood Safety:

Facilitators: Galen Conti, Claude Tayou- Tagny, Hem Chandra Pandey, Michel Garcia

The workshop was organised by Transfusion Transmitted Infectious Diseases Working Party and the Global Blood Safety Working Party.
The session was focused on resource limited setting ,and encouraged participants to evaluate their own infectious disease algorithms ,to consider options for doing things differently ,and to understand how donor testing can impact donors who are notified of a positive result.

2. Social Sciences of Transfusion Medicine:

Facilitators: Eamonn Ferguson, Barbara Masser,Eva - Maria Merz, Rachel Thorpe ,Jennie Haw, Kelly Holloway

The workshop discussed innovative approaches and methods from the Social Science Research in transfusion medicine including multidisciplinary collaborations when social sciences and lab science meet in transfusion medicine in order to overcome knowledge translation challenges for social science in the blood service. .

3. Unlocking the Future of Education with AI:

Facilitators: Jane's Seheult,Richard Gammon ,Arwa Al Riyami

In the context of transfusion practice, education and research, the intersection of Al was discussed in order to discover how Al - driven technologies and social media platforms can enhance and revolutionize the way transfusion practice, education and research are delivered, making it more engaging, effective and accessible thus ultimately contributing to improved patient care and safety.

4. Implementation Sciences:

Facilitators: Pierre Tiberghien, Erica Wood ,Simon Stanworth ,Jeannie Callum ,Robbie Foy
The session shared evidence ,experience and expertise in how to translate transfusion into practice.

The following key questions were discussed:

- How do you identify opportunities and priorities for improvement?
- What are the main barriers to and enablers of change?
- What evidence- based approaches are available to promote the best transfusion practice in your transfusion setting?

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- How can you monitor, evaluate and sustain change?
- Is there a role for an ISBT endorsement of critical areas for implementation?

5. Sickle cell disease: are we near a cure
Facilitators: Emmanuel Balandua, Mickey Koh, Kelly Holloway, Tokiko Nagamura
Presenter: E.Balandua

Topic: The landscape of SCD in Africa: Current Treatment options and new challenges

Overview: Sickle cell disease (SCD) is the leading cause of morbidity and mortality globally, with over 75% of patients residing in Sub-Saharan Africa (SSA). Without proper care, up to 50% of these patients may die in early childhood.

Key Points:

1. Newborn screening and access to comprehensive care have been shown to reduce SCD-related morbidity and mortality.
2. **Challenges in SSA:**
    - **Healthcare Workforce:** There is a shortage of qualified healthcare workers.
    - **Guidelines:** Lack of standardized guidelines for the clinical management of SCD.
    - **Infrastructure:** Limited infrastructure for both inpatient and outpatient care.
    - **Medication Access:** Limited access to essential medications such as Hydroxyurea.
3. **Importance of Strengthening Measures:**
    - Improving the outcomes of SCD in SSA requires strengthening the above measures to ensure better care and management of the disease.

Current Comparison of Gene Therapies and Transplants:
1. **Gene Therapies:**
    - **Follow-up Period:** Shorter follow-up time compared to transplants, resulting in less data.
    - **Efficacy:** Gene therapies currently offer a "functional cure" rather than a "true cure."
2. **Transplants:**
    - **Cure Rate:** Transplants are considered a "true cure" for SCD.
    - **Data:** A larger pool of robust data supports the curative potential of transplants.
    - **Risk/Benefit Analysis:** Transplants have shown positive outcomes in risk/benefit/cost analyses.

Currently gene therapies are not superior to transplants due to the following reasons:
1. The shorter time to follow up for gene therapy compared to transplants gives us less data.
2. The two gene therapies available are a "functional cure", while transplants currently represent a "true" cure. This may change in future with better gene editing techniques.
3. Cohort on the gene therapy trials is limited therefore it does not fully represent the entire spectrum of sickle cell patient and their phenotypes/complications
4. We increasingly have a large pool of robust data that transplants are curative and positive on a risk/benefit/cost analysis

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HSCT-allogeneic myeloablative and non myeloablative	Gene Therapy-autologous myeloablative
GvHD/graft rejection	None/not an issue so far. Persistence?
Need for immunsuppression	none
Donor needed	No need for donor
Length of follow up: medium	Short
Fitness:	Fitness:
Infertility: equivocal	Infertility from Busulfan
Procedure	GMP manufacturing
malignancy	Malignancy and Malignant transformation
Cure	"Functional Cure"

News from Advanced Research

FDA Approves Gene Therapies for Sickle Cell Disease:
In December 2023, the U.S. FDA approved two milestone treatments, Casgevy and Lyfgenia, marking the first cell-based gene therapies for the treatment of sickle cell disease (SCD) patients. These approvals represent significant advancements in the field of gene therapy.

Casgevy:

- *Technology:* Casgevy is the first FDA-approved treatment to utilize a novel gene editing technology, signifying a major breakthrough in gene therapy.
- *Indication:* Approved for the treatment of SCD patients aged 12 and older with recurrent vaso-occlusive crises.
- *Clinical Trials:* The safety and effectiveness of Casgevy were evaluated in an ongoing single-arm multicenter trial over 44 months involving adult and adolescent patients with SCD. Of the 31 patients with sufficient follow-up time, all achieved successful engraftment without experiencing graft failure or rejection.
- *Side Effects:* Common side effects included low levels of platelets and white blood cells, mouth sores, nausea, musculoskeletal pain, abdominal pain, vomiting, febrile neutropenia, headache, and itching.

Lyfgenia:

- *Technology:* Lyfgenia is a cell-based gene therapy using a lentiviral vector for genetic modification.
- *Indication:* Approved for SCD patients aged 12 and older.
- *Side Effects:* Similar to Casgevy, patients treated with Lyfgenia experienced side effects such as low platelet and white cell levels, mouth sores, nausea, musculoskeletal pain, abdominal pain, vomiting, febrile neutropenia, headache, and itching.

Cerus Corporation's INTERCEPT Blood System:
Results: Positive Topline Results for the Phase 3 Clinical Trial of the INTERCEPT blood System for RBCs in Cardiovascular Patients

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Multicentre Evaluation of Hypoxia Red Blood Cells:
Researchers:
V. Agostini, G. Ubezio, R. Hennscher, T. H. Feli Lundy, E. K. Kristoffersen, G. Grazzini, et al.

Participating Countries:
Norway, Switzerland, Germany, Italy

Background:
During the storage of red blood cells (RBCs), oxidative damage from exposure to oxygen, along with metabolic impairments, can degrade the quality of the RBCs. Hypoxic storage, where the oxygen content of RBC units is reduced to less than 20% saturation of O2 (SO2) prior to refrigeration and maintained throughout storage, mitigates the accumulation of oxidative and metabolic storage lesions, preserves RBC deformability, and improves oxygen off-loading.

Study Aim:
This multicentre study aimed to evaluate the performance of CPD/PAGGSM LP, O2/CO2-reduced RBCs stored for 42 days after pre-storage O2/CO2 reduction. The goal was to ensure that the product met acceptance criteria in each of the participating regions.
Methodology:
Whole blood was collected and processed using multiple modalities across different centers. The processing, including leucodepletion, was conducted shortly after collection, within 24 hours at ambient temperature.

Findings:
The study concluded that hypoxic RBCs were successfully validated regardless of the different modalities used for collection and processing. These results indicate that RBCs processed and stored under hypoxic conditions meet acceptance criteria for safe transfusion into patients in the four European countries involved.

Enhancing Clinical Value of RBCs with HEMANEXT One:
Hemanext One is a revolutionary red blood cell (RBC) processing and storage system designed to mitigate RBC storage lesions.

FDA Authorization:
- Hemanext One received FDA marketing authorization in September 2023.

Safety Study in Norway:
- A safety study was conducted in Norway involving 20 patients (10 with acute burns and 10 with hematological malignancies).
- Enrollment and final visits for this study have been completed, with results scheduled for publication in November 2024.
- Interim data published in Transfusion and Apheresis Science (Reikvam et al.) indicated no side effects with the hypoxic RBCs used in this study.

Regulatory Requirements in Germany:
- An advisory meeting with the Paul Ehrlich Institute (PEI) took place in early March to understand the regulatory requirements for using hypoxic blood in Germany.
- A two-arm validation study was requested to compare standard RBC processing and storage with Hemanext One.
- Results of this study will be presented in September this year and submitted to the PEI along with the regulatory dossier.

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Ongoing and Future Research:

- Hemanext is assessing the feasibility of supporting investigator-initiated studies in thalassemia patients in Greece and Italy to expedite access to hypoxic RBCs and generate more clinical data.
- The Irish Blood Transfusion Society is currently evaluating hypoxic RBCs among patients with Myelodysplastic Syndromes (MDS) and Sickle Cell Disease (SCD). They are also applying for funding to research the use of hypoxic blood in trauma patients.

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