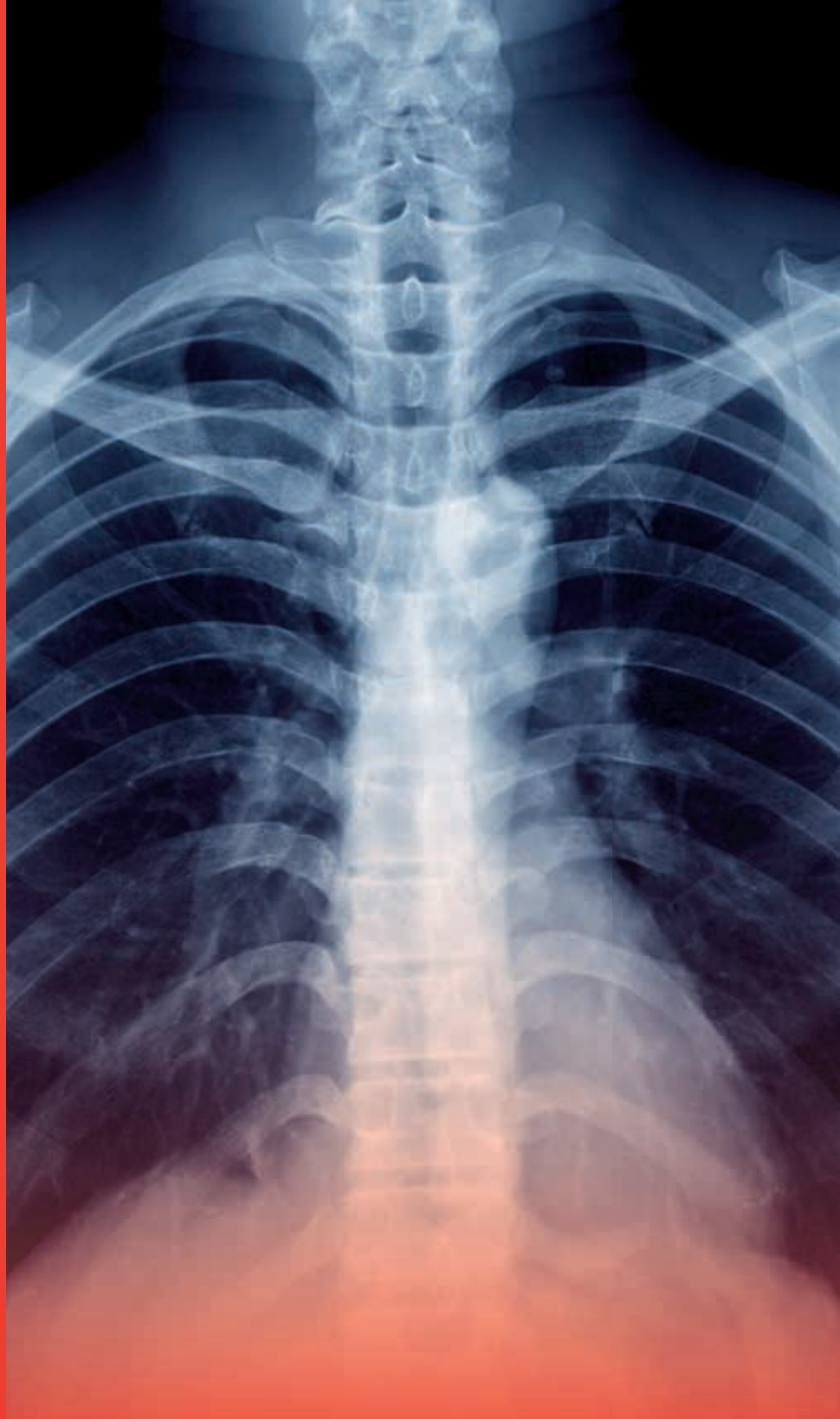
TRANSFUSION TODAY

Transfusion Today | **Number 118, March 2019**



Transfusion Risks and Complications

TRALI

Blooders Kids Project

Hyperhaemolysis

Basel Congress

ISBT

Contents

President Martin L. Olsson **Secretary General** Gwen Clarke **Executive Director** Judith Chapman
Design drukkerij Teewes **Photography** Transfusion Today **Advertising** communication@isbtweb.org

Rectification: In TT117 (December 2018) the affiliation of Giulia Bartalucci was incorrectly stated. She is currently affiliated to St. Georges Hospital in London, UK.

Send all correspondence to ISBT - Marnixstraat 317, 1016 TB, Amsterdam, the Netherlands.
T + 31 20 7601 760, communication@isbtweb.org.

Gold Corporate Partners
Abbott · Bio-Rad · Grifols · Immucor · Quotient · Roche · TERUMO BCT Unlocking the Potential of Blood

Judith Chapman

Editorial

Transfusion risks and complications is a hot topic in transfusion medicine. The focus section of this issue of Transfusion Today has five diverse articles covering febrile reactions, hyperhaemolysis, TRALI, TACO and iron overload. As transfusion professionals we need to keep in mind that the vast majority of transfusions cause no problems at all to the patient. However we do need to be aware that occasionally there will be a problem and that we should know the cause and how to handle it. The articles are useful references with respect to the complications.

ISBT membership renewal for the membership year April 2019 to March 2020 started on March 1, 2019. For the 2018/19 year the membership number was almost the same as the previous year which is very encouraging and helps us to see that our membership offering is relevant and affordable. ISBT's offering to its members is free if you are a member, no additional costs for webinars and live journal clubs or the ISBT education portal content. Please do renew your membership so that you can continue to receive all that ISBT has to offer.

ISBT also offers great awards and prizes and last November I had the great opportunity of attending the ISBT developing country award scientific symposium held in Chandigarh, India. There were so many young and enthusiastic transfusion medicine professionals in attendance, all eager to learn more. Martin Olsson our President spent some time the evening before chatting with them and encouraging them in their career in transfusion. Read more about the symposium in the from the central office section.

I do hope many of you will come to the Basel congress. I look forward to seeing you there.

Peter van den Burg
Sanquin, Amsterdam,
The Netherlands

Pierre Tiberghien
Université de Franche-Comté,
Paris, France

Allergic reaction to a blood transfusion: often innocent but on occasion a torment

Is it surprising that allergic transfusion reactions are amongst the most common transfusion reactions with frequencies from active surveillance ranging from 0,1 % (red blood cells) up to 2 % (platelets concentrates in plasma)[1]? If we realise the amount of foreign antigens a patient is exposed to in every allogeneic transfusion, we could perhaps wonder why such allergic reactions do not happen more often.

An allergic transfusion reaction is caused by a recipient dependent immune response to various proteins and other molecules contained in the (plasma containing) blood product. Such an allergic reaction can be a result of immunoglobulin (Ig) E-mediated histamine- and serotonin release by mast cells and/or basophils. IgG-mediated immune responses, molecules released by platelets in the blood product, and other factors (e.g. plasticizers or ethylene oxide,) maybe involved as well. The recipient's atopic predisposition is probably a risk factor for allergic transfusion reactions. There are also case reports where the passive transfer of donor allergy (e.g. IgE) resulted in a temporary allergy against a variety of potential allergens such as peanuts, horses or medication (penicillin)[2].

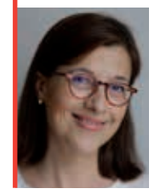
The symptoms are erythema, hives and pruritus that are often mild and can develop within seconds to several hours after blood transfusion. Such mild allergic reactions can be treated symptomatically by temporarily stopping the transfusion and administering antihistamines and/or corticosteroids. Prevention may include pre-transfusion administration of such drugs, although formal proof of efficacy of this prophylactic approach is still lacking. When, despite premedication, the allergic reactions remain a burden for the patient, the next step is blood products containing less plasma (additive solutions or 'washed' cellular products) or plasma from several donors (pooling-induced dilution and/or allergen neutralisation).

In rare cases, from less than 1:500 000 (RBC) to 1:20 000 (platelets or plasma)[3,4], the allergic reaction is severe with systemic effects that can result in life threatening anaphylactic shock and/or bronchospasm and intestinal symptoms. Immediate action including transfusion interruption, maintenance of ventilation, resuscitation with epinephrine administration is then essential. Such an anaphylactic transfusion reaction can result from a deficiency of plasma proteins such as IgA, haptoglobin or complement, and an antibody against this deficient protein. However, the clinical correlation between deficiencies with or without antibodies and transfusion reactions is poor and the entity of Ig-A-related anaphylactic transfusion reaction has been questioned [5]. Since the serious nature of anaphylaxis, prevention is of utmost importance in confirmed cases. In addition to close clinical monitoring, the main preventive measure involves transfusion with cellular blood products with no significant remnants of plasma ("washed" blood products). Transfusion with blood products from donors who are also deficient for the deficient protein in a possibility as well. In some jurisdictions, IgA-deficient donors are identified and their plasma is cryopreserved.

Overall, severe transfusion anaphylactic reactions are very rare and the 'day to day' practice comprises the more frequent mild allergic reactions. Recognition and treatment of these allergic reactions and appropriate reporting are important for good patient care. With premedication and/or modified blood products, subsequent transfusions may be more comfortable for the recipient.

References:

1) Savage WJ, Tobian AA, Savage JH, Wood RA, Schroeder JT, Ness PM. Scratching
the surface of allergic transfusion reactions. Transfusion. 2013 Jun;53(6):1361-71.
2) Ponnampalam A, Growe G, Loftus P, Chipperfield K, Bigham M. Acquired peanut hypersensitivity following platelet transfusion. Transfusion Medicine. 2014 Dec 24(6):4126-7.
3) ANSM hemovigilance data. https://www.ansm.sante.fr/var/ansm _ site/storage/original/application/eb4a3a3c16eecfdd5743fe0931100a01.pdf.
4) www.tripnet.nl.
5) Sandler SG, Eder AF, Goldman M, Winters JL. The entity of immunoglobulin A–related anaphylactic transfusion reactions is not evidence based. Transfusion. 2015 January; 55: 199-204.



France Pirenne
Etablissement
Français du Sang Paris, France

Hyperhemolysis and transfusion

Post-transfusion hyperhemolysis is a life threatening reaction on transfusion. This syndrome is defined by a drop of the post transfusion hemoglobin below the pre transfusion level, leading to profound anemia, with a destruction of both transfused and autologous RBCs and frequently accompanied by reticulocytopenia, worsening the anemia. This syndrome was first described after transfusion in SCD, but also occurs in thalassemia [1]. Some very rare cases have been reported in other conditions as well. In sickle cell disease, hyperhemolysis is the most severe form of delayed hemolytic transfusion reaction. The clinical symptoms mimic vaso-occlusive crisis (VOC), making this condition underestimated. However, LDH are increased, much more than in a classical VOC, and urines are generally dark. Additional transfusion, frequently prescribed to treat the profound anemia, can worsen the hemolysis process. Hyperhemolysis can induce multi-organ failure and death, most likely due to damage to the underlying vasculature by released free hemoglobin (Hb) and heme [2]. The mechanism of this syndrome remains enigmatic. Indeed, classically, DHTR is caused by restimulation of allo antibodies in a patient who has been already exposed to the corresponding antigen. In DHTR with hyperhemolysis, in about 30% of the cases, antibodies are not detectable or are not classically significant. It is likely that complement activation plays a key role in this syndrome. It can be activated through the classical pathway. However, in the absence of detectable antibody, beside the classical pathway, it is likely the alternative pathway could be involved. Case reports provide evidence for a final activation of complement pathways, and in some case an increase in Bb levels, indicating complement activation via the alternative pathway [3]. In these cases, efficient treatment with eculizumab (anti-C5 convertase antibody) as a salvage therapy, resulted in a demonstrated effect on hyperhemolysis, highlighting the involvement of complement [4]. However, combined triggers, potentialiser of the reaction, such as the effect of free heme on complement inhibitor, as well as the patient condition, the already activated endothelial cells in SCD should play a role but are not well defined. It was shown that this condition developed more frequently when patients were transfused in an acute condition. Then, prevention of post transfusion hyperhemolysis in SCD is challenging, partly because little is known regarding the mechanisms. Providing extended matched RBCs to allo-immunized patients and limiting the indications of transfusion in patients with history of DHTR show some efficiency, but the syndrome still developed in non-immunized patients with no history of DHTR.

Treatments to reduce allo-immunization have been proposed, such as those used in antibody mediated disease. Also, close survey is always important in punctually transfused patients, in order to diagnose very quickly this condition, and treat it adequately before multi organ failure occurs [5].

Registers of this condition and prospective studies, combining data of many centers would help to study this condition in a field with poor science based evidence.

1. King KE, Shirey RS, Lankiewicz MW, et al. Delayed hemolytic transfusion reactions in sickle cell disease: simultaneous destruction of recipients' red cells. Transfusion. 1997; 37:376–381.
2. Habibi A, Mekontso-Dessap A, Guillaud C, et al. Delayed hemolytic transfusion reaction in adult sickle cell disease: presentations, outcomes, and treatments of 99 referral center episodes. Am J Hematol. 2016;91(10):989-994.
3. Chonat S, Quarmyne MO, Bennett CM, et al. Contribution of alternative complement pathway to delayed hemolytic transfusion reaction in sickle cell disease. Haematologica. 2018 Oct;103(10):e483-e485.
4. Dumas G, Habibi A, Onimus T, et al. Eculizumab salvage therapy for delayed hemolysis transfusion reaction in sickle cell disease patients. Blood. 2016; 127(8):1062-106
5. Pirenne F, Yazdanbakhsh K. How I safely transfuse patients with sickle cell disease and manage delayed hemolytic transfusion reactions Blood. 2018 131(25):2773-2781

John-Paul Tung
The Australian Red Cross Blood Service, Brisbane

Transfusion-related acute lung injury (TRALI)

Transfusion-related lung injury (known as TRALI) can be fatal, yet we still don't fully understand what causes it. This article summarises what is known about TRALI, and what still remains to be discovered. With improved understanding, we hope to improve outcomes for recipients of blood transfusions.

The term transfusion-related acute lung injury (TRALI) was coined in 1983 [(1)]. During TRALI, patients experience difficult breathing and fluid accumulates in the lungs, both within six hours of transfusion. Transfusion-associated circulatory overload (TACO) appears similar, but has a different underlying cause. Laboratory testing is not required to diagnose TRALI, but it can help to identify donors whose blood is more likely to cause TRALI. Patients with TRALI are treated with additional oxygen, and in some cases are placed on a mechanical ventilator that helps them to breathe.

Several proteins and lipids accumulate in blood components during routine storage, and some of these have been shown to cause TRALI in laboratory and animal models. Another cause of TRALI is the transfusion of leucocyte antibodies against class I or class II human leucocyte antigens (HLA) or against human neutrophil antigens (HNA). These antibodies react with a patient's neutrophils, triggering a response that damages the lungs. These antibodies are found more frequently in women who have had children and people who have had multiple transfusions. Based upon this fact, blood services around the world have made changes that have reduced, but not eliminated, the incidence of TRALI. Specifically they have:

- Limited or stopped the direct transfusion of plasma from female donors; and/or
- Screened donors for the presence of these antibodies; and/or
- Limited the use of female donors for apheresis platelet collections.

Researchers now believe that TRALI develops when many patient and blood product factors interact to trigger activation of lung endothelial cells and neutrophils. Leucocyte antibodies, proteins and/or lipids that are present in the transfused blood component are thought to activate the recipient's neutrophils. The activated neutrophils release reactive oxygen species and enzymes that, in turn, damage the lining of the lungs, resulting in TRALI.

Researchers use a variety of laboratory and animal models to study TRALI, including the sheep model developed by our group here in Australia [(2,3)]. These studies have implicated a wide variety of cell types and molecules including neutrophils, endothelial cells, monocytes, platelets, lymphocytes and dendritic cells, as well as the gut microbiota, complement, interleukin-10, and neutrophil extracellular traps. Some of these findings have been contradictory, a fact that highlights the need for replication in this field using a variety of models. Of particular interest has been research by Kapur et al. that suggests interleukin-10 administration as a novel therapy for TRALI patients [(4)].

In summary, TRALI causes injury and death in some transfused patients. Further research into how TRALI develops, including replicating results in different TRALI models, has the potential to help design new risk reduction strategies and therapies.

References

1. Popovsky et al. Transfusion-related acute lung injury associated with passive transfer of anti-leukocyte antibodies. 1983. The American Review of Respiratory Disease
2. Tung et al. A novel in vivo ovine model of transfusion-related acute lung injury (TRALI). 2011. Vox Sanguinis
3. Tung et al. Age of blood and recipient factors determine the severity of transfusion-related acute lung injury (TRALI). 2012. Critical Care
4. Kapur et al. T regulatory cells and dendritic cells protect against transfusion-related acute lung injury via IL-10. 2017. Blood

Alexander Vlaar
Academisch Medisch Centrum, Amsterdam The Netherlands

Transfusion-associated circulatory overload (TACO)

Transfusion-associated circulatory overload (TACO) is now the leading cause of transfusion–related mortality in the EU, with an incidence reported between 0.05 – 8% of all transfused patients [(1, 2)]. It is defined as the onset of any four of the following symptoms occurring within six hours after transfusion: acute respiratory distress, tachycardia, increased blood pressure, acute or worsening pulmonary edema and/or evidence of positive fluid balance. Evidence supporting the diagnosis includes history of heart failure and increased pulmonary capillary wedge pressure (PCWP). Overall mortality is 6.5% and major morbidity, which includes life-threatening situations, ICU admission, intubation and mechanical ventilation occurs in up to 40% of patients.

The pathophysiology of TACO is poorly understood. TACO is described as hydrostatic pulmonary edema due to volume overload [(3)]. The suggested mechanism is rapid infusion of fluids resulting in a pressure increase in the pulmonary capillaries. This is measured as an increase of pressure in the left-atrium (the most optimal source to measure transduced pressure). Specifically, those whom have underlying cardiac or renal failure seem prone to develop TACO. However, pure volume overload seems unlikely since over 20% of TACO occurs after only 1 transfused unit (approximate volume ±300 mL) [(4)] and this effect is not expected in patients if an equivalent volume of fluid would be given. Transfusion products might be the culprit, directly damaging the endothelium, through accumulation of pro-inflammatory mediators during storage.

In a recent cohort study of critically ill patients new insights on the pathogenesis was obtained [(5)]. In this retrospective cohort study, patients developing TACO were compared to two control groups using multivariate analysis. The first (negative) control group consisted of transfused patients without pulmonary deterioration, the second control group consisted of patients developing cardiac overload (CO) in the absence of transfusion (positive control - to investigate whether the pathogenesis of TACO is different to CO). In total 5208 patients were screened, of which 1140 patients received transfusion. In 66 (5.8%) of transfused patients TACO was diagnosed. In total 585 transfused controls and 76 CO controls were identified. Compared to transfused controls, risk factors for TACO were history of cardiac failure (OR, 2·4 [1·2 – 4·6]; p 0·01), continuous venovenous hemofiltration (OR 3·2 [1·2 – 8·9]; p 0·03) and increase in fluid balance per liter (OR 1·15 [1·07 – 1·24]; p ≤ 0·001). An increase in fluid balance per liter was less important for developing TACO compared to CO in the absence of transfusion (OR 0·89 [0·82-0·97]; p 0·005). These results suggest that TACO follows a 'two-hit' model in which the 'first hit' is the underlying condition of the patient (renal or cardiac failure) and the 'second-hit' being the transfusion. Furthermore, the study suggests a different pathogenesis of TACO compared to cardiac overload in the absence of transfusion.

Currently no evidence-based prevention or treatment strategy is available for this life-threatening syndrome. Insight in the pathogenesis of TACO should pave the way for future prevention and treatment studies.

1. Lieberman L, Maskens C, Cserti-Gazdewich C, Hansen M, Lin Y, Pendergrast J, et al. A retrospective review of patient factors, transfusion practices, and outcomes in patients with transfusion-associated circulatory overload. Transfus Med Rev. 2013;27(4):206-12.
2. Bierbaum BE, Callaghan JJ, Galante JO, Rubash HE, Tooms RE, Welch RB. An analysis of blood management in patients having a total hip or knee arthroplasty. J Bone Joint Surg Am. 1999;81(1):2-10.
3. Andrzejewski C, Jr., Casey MA, Popovsky MA. How we view and approach transfusion-associated circulatory overload: pathogenesis, diagnosis, management, mitigation, and prevention. Transfusion. 2013;53(12):3037-47.
4. Popovsky MA, & Taswell, H. F. Circulatory overload-an underdiagnosed cosequence of transfusion. Transfusion. 1985;Vol. 25(No. 5):469-.
5. Bosboom JJ, Klanderman RB, Zijp M, Hollmann MW, Veelo DP, Binnekade JM, et al. Incidence, risk factors, and outcome of transfusion-associated circulatory overload in a mixed intensive care unit population: a nested case-control study. Transfusion. 2018;58(2):498-506.

Ziad Solh
London Health Sciences Centre,
Ontario, Canada

Iron overload: The heavy burden of chronic transfusion

Blood transfusion is a lifesaving therapy with known infectious and non-infectious complications. Most acute complications are monitored carefully by vein-to-vein hemovigilance systems, but some insidious transfusion complications, such as iron overload, are not reported to hemovigilance systems [(1)]. As such, surveillance of iron overload lies in the hands of treating healthcare providers especially those who provide chronic transfusion therapy. Not all iron overload is transfused-related. This article will only focus on transfusional iron overload.

What is chronic transfusion therapy?
Chronic transfusion therapy is the procedure of transfusing red cells to a patient on a regular basis (usually monthly) either for life or for a certain time period to treat or prevent disease signs and symptoms. It is indicated in several conditions including sickle cell disease, thalassemia, myelodysplastic syndrome, and bone marrow failure [(2)]. Chronic transfusion is different from episodic transfusion, which is defined as a single transfusion event that may or may not be repeated as needed (e.g. transfusion for chemotherapy-induced anemia).

What is transfusion-related iron overload?
With chronic transfusion or repeated episodic transfusion, iron contained in the red cell units (250mg of iron per unit) is not metabolized and excreted as rapidly as it is transfused. Transfusional iron loading happens when there is accumulation of non-transferrin bound iron in body tissues (liver, heart, endocrine glands) which, if not detected and treated early, can lead to formation of reactive oxygen species and organ damage.

Management
Because iron overload is an insidious complication, a high index of suspicion and knowledge of risk factors are needed. Once the patient has received approximately 15-20 units of red cells (or the equivalent dose in children), screening with a serum ferritin test is recommended. If the ferritin is > 3000 ng/mL, iron overload is more accurately determined using organ-specific imaging such as liver iron concentration (LIC) with magnetic resonance imaging (MRI), and cardiac T2* MRI.[(3)] In some conditions, like sickle cell disease, iron overload can be prevented using an exchange transfusion strategy. Treatment of iron overload is with iron chelation drugs, which require follow up for adherence and monitoring for side effects.[(4)]

References:

1. Ontario Transfusion Transmitted Injuries Surveillance System (TTISS) Program Report: 2012 -2016. McMaster Transfusion Research Program, McMaster University, August 2017.
2. Adams R et al. Stroke and conversion to high risk in children screened with transcranial Doppler ultrasound during the STOP study. Blood 2004.
3. Adamkiewicz TV et al. Serum ferritin level changes in children with sickle cell disease on chronic blood transfusion are nonlinear and are associated with iron load and liver injury. Blood 2009.
4. Cappellini MD et al. Tailoring iron chelation by iron intake and serum ferritin: The prospective EPIC study of deferasirox in 1744 patients with transfusion-dependent anemias. Haematologica. 2010.

Dear ISBT members,

Welcome to a new year of possibilities with your favourite professional society. After the holiday season, it is quite refreshing to think about all we can achieve together during 2019. As you know, we are currently gearing up to prepare the European Regional congress in Basel, Switzerland. We are looking forward to seeing you there. It looks like it will be a great meeting!

As you may have seen online, the ISBT Board of Directors met in Amsterdam in November to begin outlining an updated strategy for the Society. This work is of vital importance to keep us relevant in a changing world and will continue before the congress in June. We also noted that our Executive Director, Judith Chapman, celebrated ten years on the job. During the past decade, ISBT has grown as an organisation and become more professional, more visible and much appreciated by the transfusion community. This success would not have been possible without Judith and her team at the Central Office. For me as the President, they are absolutely invaluable and of course vital to all our operations. The support they give to Board, our Working Party Chairs and the whole membership is outstanding.

One of the most critically important tasks for me and the rest of the Board is therefore to secure a smooth transition since Judith announced last year a wish to retire.. We therefore engaged a headhunting firm in early 2018 and evaluated possible candidates for the Executive Director position. It is my hope to be able to present the selected candidate to the membership soon. The plan is to allow time for the new person to work in parallel with Judith on and off during the year to learn the ins and outs of the Society. Even if Judith will be a tough act to follow, I remain confident that we are close to a solution that will be great for the Society.

I mentioned the Working Parties and as you know, they really are the engine of ISBT. This is where much of the scientific and educational work is being performed by dedicated members, giving generously of their time and expertise in our field to improve donor and patient care. This issue of Transfusion Today deals with an issue which keeps many of our Working Parties busy, namely transfusion risks and complications. This is of course close to the heart of almost everything we do – how to deal with risk and avoid complications worldwide. I would like to thank all of you who provided examples of the excellent work that is being performed by our members in this important field of study.

With this, I would like to remind you not to forget to renew your membership when the new membership year stars on April 1, so that you can enjoy another year with us. Thanks again for your support of ISBT, the global go-to organisation for high-quality science and education in transfusion medicine!

Martin L Olsson
ISBT President

Basel is a city on the Rhine River in northwest Switzerland, bordering both France and Germany. Its medieval old town centers around Marktplatz, dominated by the 16th-century, red-sandstone Town Hall. Its 12th-century Gothic cathedral has city views, and contains the tomb of the 16th-century Dutch scholar, Erasmus. The city's university houses some of Erasmus' works.

For such a small place, the cultural life in Basel is astonishing. The city sits on the Rhine, with mountain views and plenty of historic sites. It's also a focal point for modern architecture; one of the charming things about Basel is the way old and new are intimately intertwined. Don't forget to take a swim in the Rhine, which is an old custom among locals.

Basel is generally known as the culture capital of Switzerland. And not without reason: art can be seen wherever you go, whether strolling through the beautiful Old Town or when visiting one of the almost 40 museums. With their themed collections, the museums have something for every taste and many have reputations that stretch far beyond the Swiss border. On top of that, there are countless galleries scattered throughout the city. And that's not all: the many top-class events that take place here throughout the year, strengthen Basel's reputation as a cultural hotspot. The city also has a lively theatre and music scene.

Register and join us
Register before May 9 and you will be able to register for the early member registration fee which ranges from €200 for students and delegates from Low World Bank Index (WBI) countries to €350 for delegates from upper medium WBI countries and €450 for all other countries. This is a much lower price than other transfusion medicine congresses and offers excellent value for money with a full 4 day and a half scientific programme, workshops, poster walk with refreshments, satellite symposia, refreshment breaks, lunch, and a welcome reception with full buffet.

Become an ISBT member and benefit from the reduced registration fee. Further information about ISBT membership and how to join can be found on www.isbtweb.org

Key dates
Deadline early registration fee: Thursday May 9, 2019
Deadline late registration fee: Thursday June 13, 2019
Onsite fee as of June 14, 2019

Workshops
In Basel we will again organise workshops where you can bolster essential skills that all researchers need to write, fund, and present your work.

The "Fundamentals of Good Grant Writing" workshop will be held on Monday, June 24, at 8.30 - 10.00 and is hosted by Imelda Bates. Imelda is Professor in Clinical Tropical Haematology at the Liverpool School of Tropical Medicine

"I attended the Young Professionals Breakfast, which was very rewarding. Researchers and experts from different countries sat next to each other exchanging ideas, experiences and challenges" G. Wu

"One of the highlights of the congress was meeting mentors and being able to chat with them at the Young Professionals breakfast" K. Winter

(LSTM) in the UK. Imelda is experienced and successful in the grant application process being the recipient of a number of big grants. She teaches on the LSTM Diploma and Masters programmes and the Consultancy course, and has supervised many successful PhD and Masters students.

After a succesful ISBT Webinar in 2018 we have invited Bob van der Laaken to present a workshop on Scientific Writing. Bob works at the Delft University of Technology where he is head of the English department. Bob teaches Academic Skills, Intercultural Communication and English as a Foreign Language and he is co-author of the book Presentation Techniques. The workshop will be held on Tuesday, June 25, at 8:30-10:00.

The final workshop is titled 'Pitch your research idea', and will take place on Wednesday June 26 at 08.30-10.00. During this session you will have the opportunity to present your research idea in 5 minutes to a panel of experts and receive expert feedback. To have the opportunity to present your pitch you will need to complete a registration form which can be found on the congress website.

Breakfast sessions Monday June 24 and Tuesday June 25, 07.00 - 08.15
On Monday June 24 a breakfast will be organized for Young Professionals to facilitate an informal networking meeting between Young Professionals (under 40 years old) and Transfusion Medicine experts. An application form can be found on the congress website.

On Tuesday June 25 the Transfusion Practitioners breakfast will take place from 07.00 - 08.15. The Transfusion Practitioner networking breakfast is a great opportunity for transfusion practitioners, and those interested in developing the role, to connect and discuss common interests and establish links that can be further developed throughout the congress and beyond.

Welcome to our new members

(September 2018 - November 2018)

Americas
- **CANADA:** Heba Abukhadra
- **USA:** Chitra Manohar, Meredith Lummer

Europe
- **BELARUS:** Volha Makhina
- **GERMANY:** Christina Mentzer
- **HUNGARY:** Krisztina Rigo
- **IRELAND:** Louise Pomeroy
- **TALY:** Mauro Montanari
- **PORTUGAL:** Filipe Goncalves
- **SPAIN:** Carmen Coello de Portugal Casana
- **SWEDEN:** Asa Hellberg

South East Asia
- **INDIA:** Heirangkhong Jam Ranjana Devi, Sharanya Ramakrishnan, Kiran Rajeev T, Aswar Prasad Chennamsetty, Sarika Agarwal, Harnoor Singh Bhardwaj, Anjali Chavan, Namrata Datta, Anshul Gupta, Fathima Cheriya Meethala Thajri, Rahul Chaurasia, Rajendra Kulkarni

Western Pacific
- **JAPAN:** Tadashi Matsushita
- **NEW ZEALAND:** Jinny Youn Jin
- **SOUTH KOREA:** Yoo-Sung Hwang

ISBT membership renewal

2019-2020

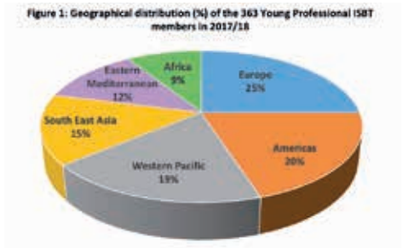
The start of a new membership year is once again upon us. We thank you for your support of ISBT in 2018 in its mission of sharing knowledge to enhance transfusion practice, and hope you continue your membership in 2019.

You are invited to renew your ISBT membership for the membership year 2019-2020 (April 1, 2019 to March 31, 2020). You can renew your membership now and continue enjoying all the benefits ISBT has in store for you, including:

- Free access to ISBT Education: here you have access to congress webcasts, past webinars, the library of guidelines and much more
- Free access to monthly ISBT Webinars and Live Journal Clubs: learn about various topics presented by experts in the field
- Registration discounts for ISBT congresses
- Free access to the ISBT Forum: network with colleagues and experts in your field
- Free access to ISBT's Vox Sanguinis and the ISBT Science Series
- Free receipt of our quarterly magazine Transfusion Today
- Being part of a global community

You can follow the 5-step guide in the infographic right if you need help on renewing your membership.

For any further help or questions regarding your membership you are welcome to send an email to membership@isbtweb.org



Current status and opportunities for Young Professionals in ISBT

John-Paul Tung
Australian Red Cross Blood Service, Brisbane

This article is written by the inaugural ISBT Young Professionals Council, which commenced in 2018 (bit.ly/ISBTYPC). Our aim is to increase the value of ISBT membership and to promote active participation of the Young Professionals (≤ 35 years old) in the Society's activities. With this in mind, it is important to have an understanding of the current Young Professionals' involvement in the society and what activities are already available.

How many ISBT members are Young Professionals and where are they based?

In 2017/18, 362 or 21% of the 1,731 ISBT members were aged <35, and therefore considered Young Professionals. The 362 Young Professional members were from all around the world, with Europe, the Americas and the Western Pacific the most heavily represented regions based upon WHO's regional classifications (Figure 1).

Opportunities for Young Professionals at ISBT congresses
There are several activities available for Young Professionals at ISBT Congresses:

- The Harold Gunson Fellowship is a travel grant for young researchers (≤ 40 years old) to attend an ISBT International or Regional Congress. Twenty-five Fellowships were awarded at the Toronto International Congress.
- There are special Young Investigators sessions at ISBT congresses. In Toronto, 215 (22%) of the 992 abstracts selected for presentations were submitted by Young Professionals. Six abstracts were selected for the Young Investigators session, 27 abstracts selected for oral presentations in other sessions, and 182 abstracts selected for poster presentations.
- The Young Investigators breakfast session allows younger members to meet and talk with transfusion medicine experts about the challenges and joys of research. In Toronto, 42 Young Professionals registered for this session.
- There are workshops designed for Young Professionals during ISBT congresses. At the upcoming Congress in Basel three workshops will be organised.

Other opportunities for ISBT Young Professionals
There are further opportunities for ISBT Young Professional members outside of ISBT congresses:

- The I TRY IT Program is a two year Transfusion Research Training program for Young Professionals. Participants learn how to develop research protocols and how to write a manuscript. The programme consists of a number of web-based lessons, combined with in-person meetings at ISBT congresses.
- Each month an ISBT webinar on various Transfusion Medicine topics is organised. During these live events attendees are able to ask questions and discuss the topic.
- Every two months the ISBT holds an online Live Journal Club where scientific articles are discussed by experts. ISBT members can ask questions and discuss the article.
- There is also the ISBT Forum available for all ISBT members. There are several specific forums available, including one for Young Professionals.

The ISBT Webinars, Live Journal Clubs and the ISBT Forum are freely accessible. Moreover, recordings of past ISBT webinars and Live Journal Club sessions are available on ISBT Education.

What is next?

Every three months an ISBT Webinar will be dedicated to Young Professionals. The topic of the webinar will help the professional development of Young Professionals and the session will be co-hosted by a member of the council. There will be a "speed dating" session at the Basel congress to facilitate further interaction between Young Professionals and experienced ISBT members. Further ideas for activities or ways to improve the experience of ISBT Young Professional members are welcome and can be communicated to myself (jtung@redcrossblood.org.au) or other council members (bit.ly/ISBTYPC). Further ideas for activities or ways to improve the experience of Young Professional ISBT members are welcome and can be communicated to myself (jtung@redcrossblood.org.au) or other council members (e-mail addresses of the ISBT Young Professional Council members are listed on the ISBT website). Young members are also invited to share with us their thoughts and activities within the ISBT society through the different social media channels using #ISBTYoungBlood.

ISBT at the 12th education course for leaders of the blood services in China

The Education Course for Leaders of the Blood Services in China (ECLBS) is an intensive 18-day educational programme that was established by the Shanghai Blood Centre, the WHO Collaborating Centre, Chinese Society of Blood Transfusion and AABB in 2006. In 2009, Silvano Wendel, ISBT President, and Judith Chapman, ISBT Executive Director, joined the third round of the course and after discussion with the management board ISBT was pleased to sign an MoU with the four partner organisations in 2011.

Since that moment ISBT has been present providing a teacher for one of the sessions at each round of the course on a range of topics including donors and donation, transfusion transmitted infectious diseases, haemovigilance, clinical aspects of transfusion and big data. ISBT also reviews curricula and course materials as necessary.

The course attendees learn about all aspects of transfusion medicine during the 18 days of the course. They take an extensive test at the beginning of the course and one at the end, which helps them and the management committee see how much they have learnt. Participants are divided into different teams to work together on projects and presentations. They also have fun sessions learning about teamwork and solving problems together. All of the sessions equip participants for their role in leading at one of the many regional blood centres in China.

Judith Chapman, Executive Director of ISBT, attended the opening ceremony of the 12th course in November 2018 and Christian Erikstrup participated in the course as the ISBT lecturer with a specific remit to speak on big data in transfusion medicine. Judith has been pleased to attend the ECLBS opening ceremony whenever possible and to meet the course participants. The dinners on the opening and closing evenings have also been memorable experiences. ISBT continues to see the value of the course to the participants and has seen how the participants develop and grow. Many were present at the ISBT congress in Guangzhou in 2017.

ISBT has been honoured to participate in management committee meetings and to contribute ideas to the development of the course. ISBT acknowledges the effort from all the course management committee and the Shanghai Blood Centre who are involved in ensuring a very effective programme.

Eva-Maria Merz
Vrije Universiteit Amsterdam,
The Netherlands

ISBT Science Series special issue on blood donor research

The ISBT Science Series dedicated an entire issue, including ten original studies, to donor research. Key researchers in the field of blood donor studies were invited to contribute their work on donor behaviour, health and product quality. For the first time that many scientific papers are centered around blood donors – a wealth of knowledge for blood banks worldwide.

Without blood donors, there would be no blood products to transfuse and no plasma derived pharmaceutical drug production. In Europe alone, four million patients are treated annually with blood-derived products given by voluntary donors. However, often as little as 2-3% of the population is registered as blood donor and numbers have been decreasing over the years. At the same time, demand for blood products is shifting, in times of demographic change, immigration and longevity.

Personalized recruitment and retention
It is crucial that a country's donor pool is sufficient, healthy and diverse enough to ensure access to every need blood product. A thorough investigation of individual motivation, including dynamic approaches, social network factors, and contextual differences is vital to develop evidence-based donor management. In this regard, four highly diverse papers from different regions across the world investigated different types of prosocial behaviour, including charity-giving, volunteer work and blood and organ donation; advocate for more personalized and evidence-based recruitment and retention to reach out to groups of potential donors; recommend that blood bank staff address donors' emotional responses to diminish negative impact of deferral on return; and project future blood demand and number of required donations.

Donor health
Although blood donation is generally regarded safe, some short- and long-term side effects may occur. Studying and maintaining donor health is important for a stable blood supply. Donor health issues are addressed in three high quality studies on how to examine long-term health consequences of blood donation; the importance of identifying characteristics that put donors at risk for experiencing vasovagal reactions and urge for developing interventions that reduce this risk; and more evidence-based selection criteria for donors with a history of cancer.

Donor characteristics, product quality and patient outcome
A third line of important donor research concerns associations between donor characteristics, product quality, and patient outcome. Recent studies show that also in vitro quality of stored red blood cell products or platelet concentrates may be affected by donor characteristics. Hence, evidence-based donor selection is needed to minimize donor-associated risks for poor product quality. Three studies differently approached this topic and call for evidence-based selection criteria for donors who use non-steroidal anti-inflammatory drugs; examined the association between lipemic whole blood donations and quality of red cell concentrates, due to specific donor characteristics; and suggest that more attention should be paid to donor demographics in providing red cell concentrates for immunomodulatory studies and the impact on transfusion reactions.

All studies contribute to the idea that future research should not only shed light on the associations between donor characteristics, product quality and transfusion outcomes, but also try to elucidate the mechanisms behind these associations.

https://onlinelibrary.wiley.com/toc/17512824/2018/13/4

Neelam Marwaha
PGIMER
Chandigarh, India

R.R. Sharma
PGIMER
Chandigarh, India

International symposium on blood safety

An International Symposium on Blood Safety was organized jointly by the Department of Transfusion Medicine, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, India and the International Society of Blood Transfusion (ISBT) on November 30th, 2018. The symposium was supported by the ISBT as part of the 'ISBT Developing Country Award' to the Department of Transfusion Medicine, PGIMER, Chandigarh, conferred at the 35th International Congress of the ISBT in Toronto, Canada, 2018.

Prof. Neelam Marwaha, the Organizing Chairperson of the symposium, delivered the welcome address and expressed her gratitude to ISBT for supporting this scientific event in Chandigarh. The scientific session began with the theme 'Understanding blood supply challenges in developing countries' in which the Executive Director of the International Society of Blood Transfusion, Judith Chapman discussed about the 'Current ISBT initiatives in improving transfusion services in the developing countries'. She gave a detailed information about the educational initiatives through the Knowledge and Education platform of the ISBT and mechanisms for scientific and financial support for educational symposia and workshops through the ISBT Academy. Dr. Shobini Rajan, Director, National Blood Transfusion Council, gave a presentation on blood supply challenges in India with regard to achievements and future strategies. Prof. Rajendra Chaudhary discussed in detail about the donor selection criteria- current update in Indian context and emphasized the need for uniformity and periodic review of these criteria. Dr. Akanksha Bisht, Officer In-charge, Hemovigilance programme, India, stressed upon the importance of donor vigilance and the status of donor vigilance programme in India. Highlights of the Renewed ISBT Code of Ethics were presented by Judith Chapman.

The session concerning the improvement of blood component quality and clinical transfusion practice included talks on Hospital Transfusion Committee: Roles and responsibilities and Patient Blood Management by Dr. Shubha Allard, from London, UK. Prof. Ravneet Kaur deliberated upon the optimization of the blood component production process taking into account good manufacturing practices as applicable. The scientific sessions also included interesting situation and case presentations by Dr. Satyam Arora, Dr. Gopal Patidar and Dr. Naveen Agnihotri.

During the symposium the '3rd Prof. J. G. Jolly Memorial Oration' was also held in the memory of Late Prof J. G. Jolly, the founder head of the Department of Transfusion Medicine at PGIMER, Chandigarh. The oration was given by Prof. Martin L. Olsson, Senior Consultant Transfusion Medicine, Vice Dean, Research Infrastructure, Faculty of Medicine, Lund University, Sweden and President, International Society of Blood Transfusion. The topic of oration was 'Blood Group Discovery in the Era of Big Data' where he stressed upon the need for analysis of the available genetic data regarding red cell antigens across the globe to have a better understanding of blood group biology. The Director of the Institute, Prof. Jagat Ram and Dean (Academics), Prof. Rajesh Kumar presided over the oration function and honoured Prof Martin Olsson with a memento and scroll.

More than 200 delegates from the northern provinces of India, working in the field of transfusion medicine attended the symposium. The delegates had an opportunity to interact with eminent national and international faculty. The scientific sessions focused on the challenges and advances in the field of transfusion medicine and there were enthusiastic discussions on various aspects of blood safety and clinical transfusion. The postgraduate students of Transfusion Medicine from various Medical colleges and Institutes from the region submitted their scientific abstracts (26) and three best entries were awarded with the prizes.

EDUCATION

Arwa Al Riyami
Sultan Qaboos University Hospital, Oman

Transfusion medicine e-learning modules

Physicians' knowledge of transfusion medicine (TM) is considered essential and critical for patients' safety. Blood transfusion is not without risks with ongoing concerns on both infectious and non-infectious potential consequences, and is associated with costs to the healthcare systems. In addition, there are increasing transfusion demands in different clinical services, which raise the need for better utilization of existing resources. Practice interventions are essential in order to ensure safety of the transfusion cycle, improve patient outcome, and to ensure better utilization of existing resources to meet patient demands.

Despite the importance of appropriate use of blood products, many clinicians who are involved in day-to-day transfusion practice have little or no formal TM training. In addition, few physicians manage to stay current regarding the transfusion literature and existing recommendations. This results in a wide variation in transfusion practice. It has been published previously that the most common place to receive formal TM teaching is while at medical school [(1)]. However, the amount of teaching received varies between medical schools, with no data existing regarding the efficiency of the different curricula. Alternative options include e-learning, which has been reported to be the most common mean of transfusion education for post-graduates in countries such as the United Kingdom. [(2)] There are different modules that exist, but some are not free of charge, while others may not be applicable to resource-limited countries.

With support from the ISBT Academy and the European Blood Alliance (EBA), the ISBT Clinical Transfusion Working party has been working on developing e-learning modules tailored to young physicians in their first years of practice. The first pilot module focused on transfusion reactions and was designed to be case-based in order to resemble daily practice in the most optimal way. The WP has developed seven case-based scenarios within this module, addressing common and serious acute transfusion reactions, namely: hemolytic transfusion reactions, febrile non-hemolytic transfusion reactions, septic reaction, allergic reaction, anaphylactic reaction, transfusion associated circulatory overload (TACO) and transfusion-related acute lung injury (TRALI). The cases cover clinical presentation, differential diagnosis, investigations and immediate management actions. The cases are designed to be interactive allowing the participant to learn throughout and to build knowledge as they go through. They are also expected to interpret laboratory investigations done as part of workup of the transfusion reaction and to correlate the blood bank investigations done with the clinical manifestations. A quiz will be included that aims at assessing the knowledge acquired throughout. The cases are expected to go live on the next ISBT meeting in Basel.

The Clinical Transfusion working party would like to acknowledge all TM professionals who helped in reviewing the content of the modules.

This article was co-authored by Cynthia So-Osman, Peter Van Den Burg, Lizzy Van Pampus and Olivier Garraud

References:

1. Graham, J., J. Grant-Casey, et al. (2014). Assessing transfusion competency in junior doctors: a retrospective cohort study. Transfusion 54, 128-136.
2. Brooks, Hannah L., et al. "Perceptions and Impact of Mandatory eLearning for Foundation Trainee Doctors: A Qualitative Evaluation." PloS one 11.12 (2016): e0168558

ISBT ACADEMY

France Pirenne
President of the French Society of Blood Transfusion

The first international seminar on delayed hemolytic transfusion reaction in Sickle Cell Disease

Delayed hemolytic transfusion reaction (DHTR) is the most dreaded complication of transfusion in sickle cell disease patients. Its frequency is underestimated, because the symptoms mimic vaso-occlusive crisis, and the underlying mechanism remains unclear. Alloimmunization is probably the leading cause of DHTR, but no antibodies are detectable in 30% of cases. There is currently no consensus concerning prevention and treatment, which depend on the underlying mechanism.

A meeting jointly supported by the International Society of Blood Transfusion (ISBT) and the French Society of Blood Transfusion (SFTS) on delayed hemolytic transfusion reaction (DHTR) in sickle cell disease took place December 17, 2018, in Creteil, France. This meeting was also organized with the support of Paris Est Créteil University, Labex GR-ex, Grand Paris Sud-Est Avenir, the Etablissement Français du Sang, under the aegis of the healthcare network for rare genetic diseases of red blood cells. This meeting was designed to consider all aspects of DHTR, bringing together specialists in the field, clinicians, scientists, and transfusion professionals, but also members of patient associations. More than 130 delegates from seven countries attended this international meeting.

Clinical, biological and therapeutic aspects were presented in the morning session. The definition of DHTR, including its most severe form, hyperhemolysis, was discussed. In SCD patients, DHTR has an incidence of about 4%, and accounts for 6% of all deaths. The clinical and biological presentation of DHTR was discussed in detail, together with its diagnosis (based on a nomogram using the post-transfusion HbA% and total Hb levels), prevention, and treatment. An analysis of French hemovigilance data for 2000 to 2016 was also presented, assessing the need to improve the recognition and declaration of this life-threatening reaction.

A number of cases, in adults and children, from France and from the US, were presented. These case reports demonstrated the difficulties of diagnosis and treatment decisions, but showed that eculizumab, an anti-C5 convertase antibody, probably stopped the hemolysis process efficiently in severe cases of hyperhemolysis. They also highlighted the importance of being aware of alloimmunization and DHTR history for the prevention of this syndrome.

The afternoon session was devoted to the pathophysiology of DHTR, and aimed to bring together the different pieces of a puzzle. The role of alloimmunization as the main trigger was discussed. Data from animal models and human studies have demonstrated the toxicity of the free heme released by hyperhemolysis to endothelial cells. The protective role of patrolling monocytes expressing high levels of heme oxidase-1, which scavenge endothelial cells injured by circulating heme, was also described. Finally, complement activation, through the binding of antibodies to microvesicles originating from red blood cells in the bloodstream, and to free heme, has shown this activation to be a major element of DHTR, providing evidence to a potential therapeutic role for complement inhibitors.

In conclusion, this meeting highlighted the need for more research in this field, and showed that the teams of clinicians and scientists working in this area are making progress towards understanding, preventing and managing this life-threatening condition more effectively.

Parents and teachers as lifesaving role-models: The Blooders.org educational program to encourage the future of voluntary blood donation

César Esquivel Téllez
Blooders.org, Mexico

Clotilde Estrada Carsolio
Blooders.org, Mexico

The objectives of the Blooders.org educational programme are:

- to implement an altruistic blood donation educational program with children from 5 to 8 years and 9-12 years old with informative activities (images, cartoons and videos) according to their ages.
- Measure the impact (in an indirect way) of the educational program with the donors (parents and school staff) participating in the blood drive.

Blooders.org carried out a blood donation educational programs in four different schools. Students from 5 to 15 years old, their parents, and teachers participated in the program. The programme consisted of four educational moments, focused on essential questions such as “What is blood donation?”, “How technology will change blood donation?”, “Why it is important?”, and “How can you help?”. As educational support, Blooders.org used images, cartoons, and videos for the students. The fourth educational moment included a Share Party (blood drive) where parents and teachers could donate blood. Each Share Party engaged a number of candidates who signed up for donation. After a screening process most participants were eligible to donate blood.

Two of the four schools had the opportunity to repeat the program. To measure the engagement of parents and teachers in the voluntary blood donation a participation rate was calculated as the percentage of blood donation candidates out of the impacted student population. Furthermore, we interpreted the engagement of parents and teachers on voluntary blood donation as a proxy to measure the students’ willingness to donate blood in the future.

It is expected that the educational program will have a positive influence on improving voluntary blood donation engagement of parents and teachers. By doing so, there is a greater chance to improve the students’ willingness to donate blood in the future. It is important to mention that further studies need to be done to directly assess the students’ willingness to donate blood as they grow up.

Findings

Each school presented a similar percentage of donors among candidates. There was no significant difference between schools in terms of gender of participants, but there was a major difference between the schools that repeated the program and the ones that did not. This could first of all indicate that the blood-donation screening process is consistent, but also that Blooders.org can focus on how to improve blood-donor repetition percentages.

Table 3.- First time blood donation candidates by intervention

	School A Int 1	School B Int 2	School A Int 3	School C Int 4	School D Int 5	School B Int 6
Total Candidates	36	51	38	22	25	58
Total donors	30	37	35	21	19	47
Total First Time donors	15	22	11	9	10	33
Male Candidates	15	4	14	3	6	12
First time male candidates	2 (13.3%)	0	1 (7.1%)	1 (33.3%)	1 (16.7%)	6 (50.0%)
Female Candidates	21	47	24	19	19	46
First time female candidates	13 (61.9%)	22 (46.8%)	10 (41.7%)	8 (42.1%)	9 (47.4%)	27 (58.7%)

From our data we observe a higher percentage of participation on the schools where we ran the program for the second time. We also saw a higher percentage of female candidates. Also, most first-time donors were female. It appears the educational program is reaching a segment that did not know about or participate in blood donation before.

Furthermore, we found that for future programs a variety of ways to communicate with different age groups could be beneficial. With the younger children (5-8) we need to generate empathy with something that they know (e.g. superheroes) and for the older students it would be more helpful to have a normal conversation with them. We suggest this program should not be applied to children younger than 5 years old.

7th annual conference of the Indian Society of Transfusion Medicine (ISTM)

TRANSMEDCON 2018, Nov 2018, Kochi, Kerala, India

The conference was organized by the Transfusion Medicine Group of Kerala in association with Indian Society of Transfusion Medicine. Over the years, TRANSMEDCON has evolved to become the most important National conference dedicated to Transfusion Medicine in India. The central theme of the event was "Transfusion medicine: Evoking an integrated approach", with the need for interdisciplinary collaboration and cooperation to build a series of improved partnerships that all focus on optimizing the quality of transfusion services and the outcomes for patients receiving transfusion during the clinical care.

The venue Kochi, with its enchanting backwaters and its rich diversity of flora and fauna was an exceptional location for the event. This city with its culturally and historically rich port city located between the Arabian Sea and the Western Ghats has always been one of the most sought after destinations in India.

The preconference day had one CME program and six wet workshops– Hemorrhage and rational use of blood, Advanced Immuno-hematology, Essentials and Advances in Plasma Exchange, HLA typing and Molecular Blood Grouping, Stem Cell Processing and RBC Glycerolization, Haemostatsis and Coagulation and Flow cytometry in Transfusion Medicine.
The scientific program included 27 sessions distributed over two and half days of conference. For the first time at TRANSMEDCON, an interesting selection of international research was presented during the BEST OF ISBT sessions from Toronto 2018 during the Plenary session. International faculties delivered talks focused on RhD HDFN, audits in transfusion, the renewed ISBT Code of Ethics and EQAS in immunohematology.

Mohandoss Murugesan
Joint Secretary,
TRANSMEDCON 2018

The invited faculties shared their experience in scientific sessions like transplant immunology, stem cell program, donor management, cytapheresis, hemostasis, etc. The scientific sessions were followed by interactive Panel Discussions like Platelet based clinical therapy, Neonatal Transfusion practices, Antenatal alloimmunization, and to bleed or not to bleed donors. All sessions were well attended by delegates and followed by interactive discussions.

There were 238 abstracts submissions. Each submission was reviewed by team of scientific committee. The free paper presentations and the poster competitions ran throughout the conference and added new insights and offered potential challenging opportunities for further research and development.

The conference also witnessed the highly energetic and most interactive PG national quiz ever conducted. The gala dinner, that took place on the lawns of the splendid and historic Bolgatty palace, Kochi provided for a much needed get away from the hectic conference schedules for catching up with old friends and making new ones.

The TRANSMEDCON 2018, and the essence of the conference "evoking an integrated response" came out loud and clear, and that's what makes the conclusion even sweeter.

James Daly
ANZSBT convenor for Blood2018

BLOOD2018, the ANZSBT annual scientific meeting in Brisbane, Australia

The Australian and New Zealand Society of Blood Transfusion greatly appreciates the support of the ISBT academy for our annual scientific meeting BLOOD2018, which was held in Brisbane, Australia in October 21-24, 2018.

The BLOOD2018 meeting is the combined annual scientific meetings of the Australian and New Zealand Society of Blood Transfusion (ANZSBT), Haematology Society of Australia and New Zealand (HSANZ) and Thrombosis and Haemostasis society of Australia and New Zealand (THANZ) and was attended by a total of 1455 delegates, sponsors and speakers.

Evaluation of the meeting was extremely positive with 92% of responders rating the overall meeting as 4 or 5 out of 5. The success of the meeting depends largely on the generous support from the sponsors, the tireless contribution from the organising committee, the outstanding quality of the invited speakers and the enthusiasm of the delegates.

Invited international key-note speakers in the ANZSBT stream included

- Thierry Peyrard, National Institute of Blood Transfusion, France
- Masja De Haas, Sanquin, The Netherlands
- Brian Custer, Vitalant Research Institute, USA
- Lise Estcourt, University of Oxford, UK.
- Harvey Klein, National Institutes of Health, Clinical Centre, USA.

Thierry Peyrard delivered an enlightening presentation on “Genomics and genotyping in transfusion medicine” to over 500 delegates in the combined opening session of the meeting. He also shared his extensive knowledge in a presentation on “Pretransfusion tests in chronically transfused patients” and a masterclass on “Pitfalls in Genotyping”. The ISBT academy session on “Haemolytic Disease of the Newborn” was well attended with over 150 participants. The session included a presentation by Tanya Cawthorne from the Australian Red Cross Blood Service Red Cell Reference Laboratory on “Haemolytic Disease of the fetus and newborn – a personal perspective”, a very informative presentation by Masja De Haas on “Non-invasive fetal RhD genotyping to target antenatal RhD-Ig prophylaxis and in sensitised pregnancies”, and a presentation by Helen O’Brien from the Australian Red Cross Blood Service Research and Development on “Droplet digital PCR for non-invasive fetal genotyping”. The ANZSBT and our members are truly grateful to all international speakers for being so generous with their time and willingness to share their knowledge.

The ANZSBT’s most prestigious award, the Ruth Sanger oration was awarded to Associate Professor David Roxby who delivered an oration entitled “Sometimes it gets bloody – the challenges we face” exploring his long-standing involvement in the transfusion management of critical bleeding.

The ISBT academy once again generously supported several travel grants, awarded by ANZSBT to applicants from the Asia-Pacific region to cover costs of attending the Blood2018 meeting and the opportunity to attend a laboratory in a tertiary hospital or the Blood Service. These travel grants are always very much appreciated by the recipients, providing an otherwise unaffordable opportunity for professional development, and more importantly, the opportunity to build a network of professional contacts to offer ongoing support in their career.

Finally, the announcement that ANZSBT will be hosting the regional meeting of ISBT in 2021 created a buzz of excitement. I suggest you plan towards a trip to Australia in November 2021 - you definitely do not want to miss out!

Ana Antić
Member of the Steering Committee of Transfusion Medicine Association of Serbia

6th Transfusion Medicine Congress of Serbia.

The 6th Transfusion Medicine Congress of Serbia was held from November 7-10, 2018 in Hotel Crowne plaza in Belgrade, Serbia. It was organized by the Transfusion Medicine Association of Serbia in Cooperation with the transfusion medicine section of the Serbian Medical Society. This congress was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia, as well as the International Society of Blood Transfusion. The conference was organized under the auspices of Ministry of Health, Republic of Serbia.

There were 529 registered participants, including 345 participants from Serbia and 184 from other countries. including Macedonia, Slovenia, Croatia, Montenegro, Bosnia and Herzegovina, and Germany. There were 28 foreign speakers for plenary and introduction lectures, 9 of them were invited speakers from Slovenia, Switzerland, Bulgaria, Turkey and Croatia and 19 were domestic lecturers. The theme of the Congress was divided into ten sessions: blood donation, immunohematology and molecular immunohematology, blood components, clinical transfusion medicine, hemostasis and hemostasis disorders, immunobiology, transplant medicine, transfusion transmitted diseases, and quality in transfusion medicine. All sessions, except for the plenary session, consisted of introduction lectures and oral presentations. In total there were 21 introduction lectures, and 82 oral presentations. Also, three poster sessions, two for doctors and one for technicians (total of 55 poster presentations) were organised.

The scientific results that have been achieved in the different segments of blood transfusion and that were presented at this congress show a high degree of application in everyday practice and knowledge. Special attention was dedicated to the implementation of the new law on transfusion medicine in Serbia, cooperation and plans of the Transfusion Institutes and clinics of Clinical centers and Health centers in the country, as well as the role of the Serbian Red Cross in promoting and motivating donors in coordination with the Blood Transfusion Service. We also discussed modern technologies in blood component processing, stem cell therapy and transfusion support during stem cell transplantation, the role and importance of quality management in transfusion medicine, new blood groups, registration of rare bleeding disorders, registration of rare blood groups and registration of stem cell donors. The participants had a special opportunity to hear all news from the ISBT Red Cell Immunogenetics and Blood Group Terminology Working Party, as well as the latest findings in the field of organ transplantation, regenerative medicine and apheresis.

The participants lively discussed at the end of each session and the feedback was very positive, which gave a chance for all of us to contribute to the development and promotion of new transfusion ideas in the time ahead. All the participants also had a chance to introduce Belgrade and spend unforgettable moments during friendly gatherings.

Finally, the Transfusion Medicine Association of Serbia would like to take the opportunity to thank ISBT for their support for organization of this Congress.

NORTHERN AMERICAS

Fetal and neonatal alloimmune thrombocytopenia (FNAIT)

Fetal and neonatal alloimmune thrombocytopenia (FNAIT) occurs when maternal IgG alloantibodies to human platelet antigens (HPAs) cross the placenta and cause fetal platelet destruction (1). The incidence of FNAIT is low occurring in 0.3 – 1 in 1000, (2-4) and it is the most common cause of thrombocytopenia in a term neonate. Presentations range from an asymptomatic neonate to neonatal thrombocytopenia, petechiae, ecchymosis, and intracranial hemorrhage (ICH). FNAIT-related ICH is reported to occur in 0.02-0.1:1000 live births (4,5). When ICHs occur, they frequently occur in utero - 54% occur before 28 weeks gestation (6). The consequences of ICH include death (35%) or serious neurological sequelae in up to 83% of survivors (6). The main treatment goal is to prevent ICH from occurring either antenatally, during delivery or following the neonate's birth. Antenatal management for mother and postnatal treatment strategies for the newborn with FNAIT need to be optimized. Guidance is required for FNAIT as prospective or randomized control studies are often difficult to conduct. This leads to unanswered questions regarding best strategies for management.

In an attempt to optimize and standardize management of FNAIT, an international team of adult and pediatric hematologists, maternal fetal medicine specialists, methodologists, and transfusion medicine physicians was convened to develop a guideline for the management of FNAIT using a systematic approach and standardized method to develop recommendations. The guideline development group was assembled by the International Collaboration of Transfusion Medicine Guidelines (ICTMG). This initiative was established in 2011 and its' mandate is to establish evidence-based transfusion medicine guidelines to optimize transfusion care, to increase the credibility of guideline development for transfusion medicine by using a widely collaborative effort and consistent up-to-date methodology and to enable more timely and cost effective creation of transfusion medicine guidelines.

The guideline addressed the following: antenatal screening and management; value of diagnostic tests including HLA genotype and HPA alloantibody testing and postnatal interventions. Recommendations were formulated based on the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) method which incorporates the quality of the evidence, benefits and risks of treatments and cost.

The FNAIT guideline development group convened to discuss recommendations over a three year period and completed three systematic reviews (antenatal, postnatal and serologic (7,8)), a guidance document for evidence based management, algorithms for management, podcasts for physicians and patients and a slide set to assist with implementation of recommendations (available at ictmg.org). This collaborative effort highlights the success of a multidisciplinary international team to reach consensus on management of a rare medical condition and set the stage for future collaborative projects. The dialogues allowed members to recognize the diversity in treatment internationally to enable the development of recommendations that could be applied locally, nationally and globally while avoiding duplication of effort. For further information about the ICTMG and additional guidelines developed to date, please search https://www.ictmg.org/.

This article was co-authored by Denise Landry and Nadine Shehata.

Regional Northern Americas

Lani Lieberman
University of Toronto, Toronto, Canada

NORTHERN AMERICAS

for Recommendations FNAIT Interventions
If a platelet transfusion is indicated, HPA-selected platelets should be used if immediately available.
If HPA-selected platelets are not immediately available, HPA unselected platelets should be transfused.
Platelets should be transfused immediately if life-threatening bleeding is present.
In the presence of life-threatening bleeding in a neonate such as intracranial or gastrointestinal bleeding, platelets should be transfused to maintain platelet counts initially above 100x109/L and then above 50x109/L for at least 7 days.
In the absence of life-threatening bleeding in a neonate such as intracranial or gastrointestinal bleeding, platelets should be transfused to maintain a platelet count above $30x10^9$/L.
Antenatal IVIG administration to the mother commencing at 12-16 weeks gestation should be offered to all women in a subsequent pregnancy with maternal fetal incompatibility who have had a previous fetus or neonate with FNAIT related ICH.
For all other pregnancies with a previous neonate with FNAIT (without ICH), administering antenatal IVIG to the mother should be discussed prior to a subsequent pregnancy or when pregnancy with maternal fetal incompatibility is confirmed. a. If antenatal intervention is required, IVIG administration to the mother should be started between 20 to 22 weeks (and not later than 24 weeks) gestation.
If the fetal platelet count is unknown, assisted delivery and invasive procedures on the fetus during delivery should be avoided including forceps, vacuum-assisted delivery, scalp blood sampling and scalp electrodes.

References

1. Liu ZJ, Bussel JB, Lakkaraja M, et al. Suppression of in vitro megakaryopoiesis by maternal sera containing anti-HPA-1a antibodies. Blood 2015;126:1234-6.
2. Turner ML, Bessos H, Fagge T, et al. Prospective epidemiologic study of the outcome and cost-effectiveness of antenatal screening to detect neonatal alloimmune thrombocytopenia due to anti-HPA-1a. Transfusion 2005;45:1945-56.
3. Williamson LM, Hackett G, Rennie J, et al. The natural history of fetomaternal alloimmunization to the platelet-specific antigen HPA-1a (PIA1, Zwa) as determined by antenatal screening. Blood 1998;92:2280-7.
4. Kjeldsen-Kragh J, Killie MK, Tomter G, et al. A screening and intervention program aimed to reduce mortality and serious morbidity associated with severe neonatal alloimmune thrombocytopenia. Blood 2007;110:833-9.
5. Kamphuis MM, Paridaans N, Porcelijn L, et al. Screening in pregnancy for fetal or neonatal alloimmune thrombocytopenia: systematic review. BJOG : an international journal of obstetrics and gynaecology 2010;117:1335-43.
6. Tiller H, Kamphuis MM, Flodmark O, et al. Fetal intracranial haemorrhages caused by fetal and neonatal alloimmune thrombocytopenia: an observational cohort study of 43 cases from an international multicentre registry. BMJ open 2013;3.
7. Winkelhorst D, Murphy MF, Greinacher A, et al. Antenatal management in fetal and neonatal alloimmune thrombocytopenia: a systematic review. Blood 2017;129:1538-47.
8. Kjaer M, Bertrand G, Bakchoul T, et al. Maternal HPA-1a antibody level and its role in predicting the severity of Fetal/Neonatal Alloimmune Thrombocytopenia: a systematic review. Vox sanguinis 2018.

SOUTHERN AMERICAS

Simone C. Gilli
UNICAMP, Brazil

Transfusion in Brazilian patients with Sickle Cell Disease (SCD)

We could say that we have the perfect storm: a disease that predominantly affects African descent individuals with a rather distinct antigenic profile of erythrocytes, scarcity of perfectly compatible donors and possibly the main group at risk for red blood cell alloimmunization due to a state of sterile inflammation secondary to the recurrence of vaso-occlusion reperfusion phenomena.

Sickle cell disease (SCD) is an autosomal-recessive genetic disorder that affects approximately 100,000 people in the United States and is the most prevalent hereditary disease in Brazil (1). Transfusions can be life saving for these patients. However, the occurrence of antibodies against transfused red blood cells ranges from 10 to 60% depending on the region studied and several factors are responsible for this phenomenon, such as different protocols used for phenotyping, diversity among donors and receptors, in addition to the genotype frequencies of each region.

Nonetheless, with the advances made over the century, the survival of sickle cell patients has had a remarkable increase. Thirty years ago, we could not have imagined that today we would be dealing with elderly patients in a sea of different RH variants (2). We could not have envisioned in performing molecular compatibility in situations where this is possibly the only solution (3). We could not have conjectured that we would evaluate the clinical significance of an antibody in vitro and attain transfusion safety (4). But this is what we are doing! And maybe because of this, the incidence of transfusion complications in these patients is currently so low.

The Hematology service of the University of Campinas has registered approximately 350 adult sickle cell patients and provide extended red cell phenotyping for every transfused patient, regardless of their alloimmunization status. In addition, we use a combination of serological and genetic methods to determine the presence of alloimmunization and in some cases, the search for compatible units. This formula has worked quite well. The decrease in alloimmunization rates after we introduced this practice is evident, remaining as a residual risk following unexpected situations as undetected RH variants or when the component is not available.

However, we can do more as there are issues which remain to be better explored. The identification of factors like molecular markers (5) that increase the alloimmunization risk and characteristics related to the age of components that could interfere with the immune response, could potentially improve our tools , transforming blood transfusion into one of the most personalized and controlled processes in clinical practice.

1. Castilho L, Dinardo CL. Optimized Antigen-Matched in Sickle Cell Disease Patients: Chances and Challenges in Molecular Times –the Brazilian Way . Transfus Med Hemother 2018;45:258–262
2. Sippert E, Fujita CR, Machado D, Guelsin G, Gaspardi A, Gilli SCO, Saad STO, Castilho L: Variant RH alleles and Rh immunization in patients with Sickle Cell Disease. Blood Transfusion 2015; 13:72-7
3. da Costa DC, Pellegrino Jr J, Guelsin GA, Ribeiro KA, Gilli SC, Castilho L: Molecular matching of red blood cells is superior to serological matching in sickle cell disease patients. Rev Bras Hematol Hemoter 2013; 35:35-8.
4. Noumsi GT, Billingsley KL, Moulds JM. Successful transfusion of antigen positive blood to alloimmunised patients using a monocyte monolayer assay. Transfus Med. 2015 Apr;25(2):92-100
5. Sippert EA, Visentainer JEL, Alves HV, Rodrigues C, Gilli SCO, Addas-Carvalho M, Saad STO, Costa FF, Castilho L: Red blood cell alloimmunization in patients with sickle cell disease: correlation with HLA and cytokine gene polymorphisms. Transfusion 2017; 57:379-389

EASTERN MEDITERRANEAN

Arwa Al Riyami
Sultan Qaboos University Hospital, Oman

β- Thalassemia major in the Eastern Mediterranean region

β-Thalassemia is a common hemoglobinopathy in the Arabian Peninsula and is characterized by hemolysis and ineffective erythropoiesis. The prevalence of thalassemia extends from the Mediterranean basin through the Middle East region, Arabian Gulf, India, and Southeast Asia. β-Thalassemia is caused by a complete or partial reduction in the β-globin chain synthesis, leading to β-thalassemia major (TM) and β-thalassemia intermedia (TI) respectively. In TM, red blood cell (RBC) transfusion is a cornerstone in the treatment as a life-sustaining measure. Patients with TI, however, have a variable clinical profile with many patients requiring only occasional transfusions, and unique complications that are rarely seen in patients with TM. Treatment is therefore individualized and tailored to the severity of the clinical phenotype. Transfusion can create significant challenges in the management of patients with thalassemia including iron overload and RBC allo-immunization. Rates of RBC alloimmunization and its risk factors in patients with β-thalassemia varied between different reports, ranging between 4 and 37%, and is lower when compared to the rates reported in sickle cell disease patients receiving only ABO and D matched units.

Many of the publications on alloimmunization rates and risk factors in TM patients were in Western, Asian or Mediterranean populations and may not translate well to the patient and donor population in the Eastern Mediterranean (EMRO) region. Upon examining the literature, there are 17 publications from the EMRO region that reported the alloimmunization rates and risk factors in TM thalassemia patients. These include reports from Egypt, Iran, Pakistan, Oman, Kuwait, and Tunisia. Most of these manuscripts address TM patients, and there is scant data on patient with TI. Reported rates of alloimmunization among TM patients from the region ranged between 2.87-30%; falling within the reported rate in other populations. The most common antibodies described are anti-E and anti-K. Different risk factors of alloimmunization in TM patients were described including number of units transfused, age at time of transfusion and history of splenectomy. Universal leukoreduction was reported to be used in two centers at time of publication; one from Kuwait and one from Oman. Unfortunately, not all the reviewed manuscripts documented whether units transfused in this group of patients were leukoreduced or not. Most centers utilized ABO and D matched RBCs in non-alloimmunized patients. Only four centers in the regions reported specific alloimmunization rates in TI patients; two from Egypt, one from Oman and one from Iran. The center in Oman reported successful reduction of alloimmunization by stringent use of extended phenotype matched RBCs policy upfront for all TI patients, in line with recent guidelines which supports this practice.

Considering the relative homogeneity between the patient and donor populations in the EMRO region, rates of alloimmunization are expected to be lower when compared to other populations. Based on this review, it would be recommended to have further studies to address the rate of allo-immunization, cross-match requirements and the role of genotyping and the provision of extended phenotype-matched units in patients with β-Thalassemia from our region.

EUROPE

Role of the Blood Stocks Management Scheme in Hospital Inventory Management in England, Wales and Northern Ireland

Sue Cotton
NHS Blood and Transplant, England

The Blood Stocks Management Scheme (BSMS) was launched in 2001 as a partnership between hospitals and blood services to maximise the use of donated blood by increasing the understanding of blood inventory management across the whole supply chain. Hospitals from England, Wales and Northern Ireland are currently participating in the BSMS.

Central to the work of the BSMS is VANESA, a data management system where hospital and blood service data is collected. Hospitals using VANESA can benchmark their data using categories based on their hospital profile. The most commonly used categories include hospital size (based on red blood cell (RBC) or platelet (PLT) usage category), geographical location (based on the Regional Transfusion Committee) and the clinical specialities available within the hospital. Once appropriate benchmarking categories have been selected within VANESA, users can view inbuilt tables and charts to compare their data with similar hospitals. Figure 1 is an example of a line chart. This shows the selected users Issuable Stock Index (ISI) for O D Negative RBCs compared to other hospitals within the same benchmarking cluster. ISI is a calculated field and gives the user an idea of how much stock they are holding in terms of 'days use'.

When the BSMS was established there was little data available from hospitals regarding inventory management markers such as stock and wastage. Keeping sufficient stocks of red cells and platelets within NHS Blood and Transplant (NHSBT) was a challenge. Inventory management of red cells and platelets has become increasingly important in both hospitals and blood services to prevent unnecessary wastage.

The BSMS is a source of information and an education provider for staff within both hospitals and blood services. Educational events focussing on topical areas of the blood supply chain provide a much-valued resource for those involved with improving inventory management.

During 2018 the BSMS team has used its bank of data and detailed knowledge to collaborate with small groups/individual hospitals to improve their RBC stock levels and hence reduce inappropriate wastage. Previous work undertaken by the BSMS has shown a direct link between red cell time expiry wastage, the amount of stock held and the age of that stock. By reviewing the ordering of blood components against the usage recorded in VANESA it is possible to revise ordering patterns, reduce time expiry wastage and make financial savings. Figure 2 is an example of the reduction in time expiry (TIMEX) wastage of RBCs following a stock management review.

Increasingly hospitals within England are ordering O D Negative RBCs of high specification e.g. C-, E-, K-, which has led to non-specific O D Negative RBCs time expiring within NHSBT. By engaging with small groups of hospitals it has been possible to discuss the data, educate and change ordering practice to mirror national guidance.

In conclusion the BSMS has made a significant contribution to improved blood inventory management in hospitals and blood services by using the data held within VANESA. This data can assist hospital blood transfusion laboratories in reviewing their own stock holding based on usage, helping to reduce time expiry wastage that not only results in cost savings but also conserves the nation's blood supply.

Figure 1 - Line chart demonstrating ISI for O D Negative Red Cells in a 'Very High User' hospital

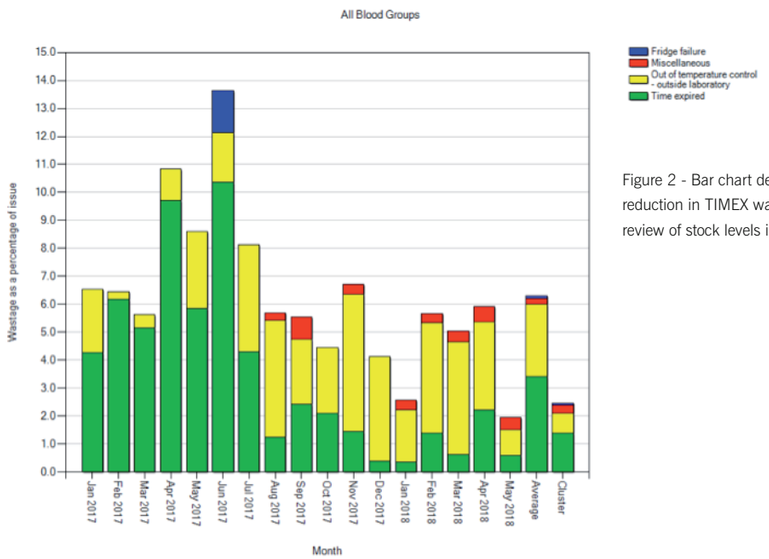


Figure 2 - Bar chart demonstrating a reduction in TIMEX wastage following BSMS review of stock levels in November 2017.

The New Zealand Blood Service Haemovigilance Program

The New Zealand Blood Service (NZBS) is a vein-to-vein transfusion service, and is the only provider of this service in New Zealand (NZ). NZ has an ethnically diverse population of around 4.9 million.

NZ is around the OECD average for per capita GDP, or health care expenditure, but higher-than-average for measures such as life expectancy at birth related to these indices.[1] Blood donations in NZ are 100% voluntary, and non-remunerated. In NZ donation rates (whole blood, apheresis, and autologous), plasma collection for fractionation, and blood component transfusion rates appear to be around the average for high-income countries and it is self-sufficient in fractionated products.[2]

The NZBS haemovigilance program (NZBS HV), established in 2005, is voluntary, confidential, comprehensive, centralised, relatively well resourced, faces few cultural barriers to the reporting of adverse events (AE) and near misses, and is a protected quality assurance activity. It uses International Haemovigilance Network definitions for AE type, severity, and imputability. Annual reports have been published since 2005.3 Figures 1 and 2 show transfusion, and selected AE (imputability level ≥ 3), rates over the years.

Figure 1.

Figure 2.

As with other voluntary HV systems, we only know about reported events – based on those, our data hold no surprises. That said, the decline - defined here as below average rates in, at least, the last three years - in allergic, TRALI (starting 2008 when male donor-only FFP for clinical use, and other mitigation measures were introduced), and events overall are worth noting. NZBS HV has also brought to light other things. We find that 15% of FNHTR are associated with significant rises in blood pressure. We are unsure if others see this. Recently, we reported a TRALI (and, possibly, TRAIN4) associated with donor anti-HLA class I antibodies alone.5 We have seen a few instances of what has been described, infrequently and briefly, as an acute pain transfusion reaction (APTR).6 Not surprisingly, given the ethnic mix, we have a few instances of DHTR due to anti-Jk3. With allergic reactions, we note that, interestingly, many are reported with, apparently, that patient's first encounter with a blood component or product. Possible explanations are being examined.

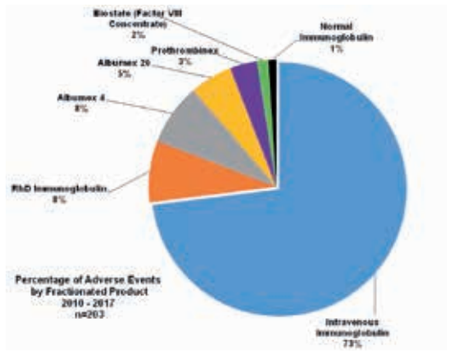
We also monitor AE to fractionated products and in blood donors. Again, there are no surprises (figures 2 and 3).

Krishna G. Badami
New Zealand
Blood Service, Christchurch

Our challenges will sound familiar to many readers. Apart from those associated with a voluntary system, they are, mainly, poor awareness, incomplete reports, and the inability to always fully follow-up and investigate reports.

Finally: is there a point to NZ, a small country, having an HV program? We think there is. It helps us to assess our position in the world, and see where improvements are needed. Secondly, unique combinations of factors are possible, in different locations, spanning the donor-processing-testing-patient spectrum, that may increase (or prevent) specific problems. Thirdly, HV is more than surveillance. It is about understanding mechanisms of AE and through communication, education, and the updating of procedures and guidelines, making transfusions and blood donations safer and more effective.

Figure 3. Adverse events with fractionated products, 2015 - 2017 (n = 203)



References:

1. OECD (2017), Health at a Glance 2017: OECD Indicators, OECD Publishing, Paris, https://doi.org/10.1787/health _ glance-2017-en. (accessed on 02 November 2018)
2. http://apps.who.int/iris/bitstream/handle/10665/254987/9789241565431-eng.pdf;jsessionid=C6A73984BDD1AD875C3739A27435F67C?sequence=1
3. https://www.nzblood.co.nz/clinical-information/haemovigilance-programme/haemovigilance-annual-report-2012/
4. Hauck-Dlimi B, Ruppel R, Zimmermann R, et al. Transfusion-related alloimmune neutropenia with no pulmonary complications: one donor—five cases. Transfusion. 2016: 56: 84 - 90
5. Kim B, Downing J, King S, Badami KG. Transfusions, troubled breathing, and transient neutropenia. Pathology. 2015; 47: 714 - 716
6. Schonegevel LA, McDonald EJ, Badami KG. Transfusion Reactions manifesting predominantly with pain. 2008; abstract P 008 https://www.anzsbt.org.au/data/documents/asmAbstracts/2008HAAposters.pdf (accessed on 12 November 2018)

SOUTHERN AMERICAS

Oscar Torres
Transfusion Transmitted Infections Committee, AAHITC

NAT testing in blood banks of Argentina

The Transfusion Transmitted Infections Committee of the Argentinean Association of Hemotherapy, Immunohematology and Cellular Therapy invited those centers in which NAT techniques were performed on blood donors, to participate in a survey.

From July to September 2016, each center filled out a voluntary survey of closed questions. Results and conclusions were reported during the Argentine's Bicentennial Independence Congress in October 2016. In addition, the surveyed centers were asked to report whether they processed samples from other institutions, and to include the data in the delivered information.

The NAT techniques were implemented in different years. Six centers started between 2004 and 2009, and the rest of the centers started as from 2013. Based on the evaluation of the surveys it was concluded that, according to the NAT technique, prevalence varied from 0.01 to 0.12% for HBV, from 0.02 to 0.09% for HCV, and from 0.02 to 0.15% for HIV. One center did not show prevalence data since only non-reactive samples resulting from the conventional screening process were analyzed by NAT.

The total number of donations tested was 1,577,427 for HIV and HCV. Since HBV testing was subsequently incorporated, only 1,438,014 donations were tested. Based on these data, the risk of transmitting infections (when only conventional serological tests were used) was calculated, and the results were the following: 14 donations HBsAg and antiHBc (-)/NAT (+), 4 anti-HCV donations (-)/NAT (+), and 11 donations anti-HIV and/or Ag p24(-)/NAT (+).

The data allow estimating the risk of transfusing a donated reactive unit within the serological window period, (defined as infections not detected by conventional serological tests), as:

- 1:102,715 (95% confidence interval (CI), 1:61,350 -1:187,970) for HBV;
- 1:394,357 (95% CI) 1:154,083-1: 1,447,178) for HCV, and
- 1: 143,402 (95% CI) 1:80,000-1:287,356) for HIV.

This same risk expressed per million donations would account for 9.7 donations for HBV, 2.5 for HCV, and 7.0 for HIV.

This study helped to understand the Argentinean experiences in the implementation of NAT. The main objective of the work was to unify the information obtained and to assess the results in relation to their contribution to the safety of the blood components to be transfused. Worldwide surveys including broad scope information on the development of NAT tests in all continents have been conducted. Although the HCV antibody window period is the longest, the number of infection cases within the window period was lower than the number of HIV and HBV cases. This could be attributed to less circulation of this virus in low risk populations in Argentina, but this should be studied further for more conclusive results. HBV infection incidence is the highest, which highlights the great need to promote infection control. In our country, vaccination has been mandatory for all newborns since 2000. The same applies to 11-year-old children since 2003, and it is universally recommended since 2012 according to the National Ministry of Health.

It is our aim to expand the available information on the incidence of infections as well as to approach a new risk estimate. All this, together with the promotion of voluntary and repeated donation, improved quality of pre-donation interviews, the implementation of appropriate quality systems in Blood Services and transfusions conducted according to evidence-based standards, will allow increasing transfusion safety in Argentina.

2019

May 9 - 11
The 6th National Conference of the Italian Society of Transfusion Medicine and Immunohematology (SIMTI)
Rimini, Italy

May 18
Haemovigilance workshop
Hong Kong, China

May 22 - 23
IPFA/PEI 26th International Workshop on "Surveillance and Screening of Blood-borne Pathogens"
Krakow, Poland

May 23 - 24
4th International Meeting on Cell-Free DNA
Copenhagen, Denmark

June 22 - 26
29th Regional Congress of ISBT
Basel, Switzerland

November 16 - 19
30th Regional Congress of ISBT
Bangkok, Thailand

Future ISBT Congresses

Basel
Bangkok
Barcelona

29th Regional Congress of the ISBT, Basel, Switzerland, June 22-26, 2019
30th Regional Congress of the ISBT, Bangkok, Thailand, November 16-19, 2019
36th International Congress of the ISBT, Barcelona, Spain, June 6-10, 2020

Get through the mosquito season without incremental donor deferrals, additional NAT-testing and risk of supply disruption.*

The INTERCEPT™ Blood System is ready.

ARE YOU?

- 2007 Paul-Ehrlich-Institut issues a guidance[1] that specifies pathogen inactivation as equivalent to donor deferral and testing for Chikungunya (CHIKV).
- 2014 Paul-Ehrlich-Institut issues a guidance[2] that specifies pathogen inactivation as equivalent to donor deferral and testing for West Nile Virus (WNV).
- 2016 WHO[3], US FDA[4] and Paul-Ehrlich-Institut guidances[5] offer pathogen inactivation as one option to mitigate risks related to Zika Virus (ZIKV) outbreaks.
- 2017 INTERCEPT™ Blood System for pathogen inactivation helps to maintain supply continuity during Chikungunya (CHIKV) outbreak in Italy[6].
- 2018 First recorded cluster of locally acquired Dengue Virus (DENV) cases in Spain[7]. Various studies demonstrated[8,9] that the INTERCEPT™ Blood System has robust pathogen inactivation for various strains of DENV.
- 2018 Number of West Nile Virus (WNV) infections in Europe exceeds the total number in the last 5 years[10]. The INTERCEPT™ Blood System enabled earlier release of apheresis platelets in France.

WNV **DENV** **CHIKV** **What's next?**

For more information on availability in your country, please visit www.interceptbloodsystem.com

* Valid for apheresis platelet concentrates only

[1]Paul-Ehrlich-Institut. Verminderung des Risikos von Chikungunya - Infektionen durch zelluläre Blutprodukte und gefrorenes Frischplasma, Anordnung der Spenderrückstellung von Personen, die sich in den letzten zwei Wochen in einem Chikungunya-Endemiegebiet aufgehalten haben (24 Jan 2007). [2]Paul-Ehrlich-Institut. Stufenplan Stufe 2: Anordnung des Ausschluss von Blutspendern zur Verhinderung einer möglichen übertragung des West-Nil-Virus durch nicht pathogen-inaktivierte Blutkomponenten (22 Jan 2014). [3]WHO Interim guidance WHO/ZIKV/HS/16.1 February 2016. [4]FDA Guidance for Industry February 2016. [5]Paul-Ehrlich-Institut. Bekanntmachung über die Zulassung von Arzneimitteln - Abwehr von Arzneimittelrisiken Stufe 2 - Verminderung des Risikos von Zika-Infektionen durch nicht pathogen-inaktivierte Blutkomponenten und gefrorenes Frischplasma (10 Mar 2016). [6]Luca Pierelli et all; Emergency response of four transfusion centers during the last Chikungunya outbreak in Italy; Transfusion 2018;9999;1–4. [7]European Centre for Disease Prevention and Control. Local transmission of dengue fever in France and Spain – 2018 — 22 October 2018. Stockholm: ECDC; 2018. [8]K. Dupuis, High Titers of Dengue Virus in Platelet Concentrates are Inactivated by Amotosalen and UVA Light, Transfusion 2012-Vol. 52 Supplement. [9]Li Kiang Tan, Evaluation of Pathogen Reduction Systems to Inactivate Dengue and Chikungunya Viruses in Apheresis Platelets Suspended in Plasma, Advances in Infectious Diseases, 2013, 3, 1-9 [10]European Centre for Disease Prevention and Control. West Nile fever in Europe - Number of infections so far exceeds the total number in the previous five years - 2018 - 24 Sep 2018. Stockholm: ECDC; 2018.

No pathogen inactivation system has been shown to inactivate all pathogens.

CERUS