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.