The ORBCoN Report
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What's New at ORBCoN?

Autumn was an exciting and busy time for ORBCoN. The 59 hospital transfusion services participating in the Ontario IVIG audit swung into full gear. Networking, sharing our resources and raising the profile of Transfusion Medicine is an important aspect of our work. At the AABB meeting in October, Kate Gagliardi had the opportunity to introduce the ORBCoN resources during the Blood Management Workshop to an international audience. Troy Thompson presented a poster about the platelet inventory web application that garnered a lot of interest from AABB attendees in Boston. Also during October, ORBCoN sponsored a speaker at the 75th Annual Ontario Association of Pathologists meeting held in Niagara-on-the-Lake. Dr. Russell Price did an exceptional job of highlighting the challenges facing the community hospital pathologist who finds themselves responsible for Transfusion Medicine.

Recently released resources include:

- Bloody Easy Lite – a 2 module e-learning program developed for use by physicians to help facilities meet the accreditation requirements for ongoing education. The program is CME accredited through the University of Toronto and facilities can track participation electronically.
- Bloody Easy Tech Assessments – 2012 questions have now been posted. Coming soon – interactive antibody investigation learning module
- Dispensary/Administration Facility Toolkit – developed to help hospitals that supply blood to other hospitals or facilities that don't have Transfusion Medicine Laboratories.

Check out these resources and much more by visiting our website at: www.transfusionontario.org.

TESS Ontario Update

Helen Downie, Lisa Merkley Sunnybrook Health Sciences Centre

The Transfusion Error Surveillance System (TESS), a web-based non-punitive anonymous error reporting system developed in collaboration with the Public Health Agency of Canada and a national working group of transfusion medicine experts, is nearing the end of its pilot phase. The Agency has decided that it will continue to support the sites currently enrolled in the pilot as sentinel sites.

The data from the sentinel sites represents clinical service support to a variety of different programs and approximately 10% of transfusions nationally. For this reason it is believed that it is a suitable data set for national benchmarking. In addition, data integrity has been secured by the tremendous efforts the sites have put into standardizing the error codes and categorizing the events.

December of this year will see the release of the 2005-2007 TESS report, providing everyone with a summary of the national transfusion activity and where we need to focus efforts and some suggested process improvement initiatives. The 2008-2010 data has been analyzed and the next report is in progress with a target release date yet to be determined.

Throughout the development of the system a User's Manual has been created to be used as a training and reference guide for new and existing users. The latest edition will be available on-line in the New Year. Transfusion services interested in capturing their error data in TESS and benchmarking against institutions of like size and activity, are encouraged to contact Sophie Yang at the Ministry of Health and Long-Term Care [Sophie.Yang@ontario.ca] who will in turn forward your request to the Public Health Agency of Canada. TESS is a fantastic tool to capture transfusion error data with built in reports to facilitate analysis and identification of transfusion and patient safety improvements.

Optimizing Blood Utilization: The Need for a Central Transfusion Registry

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In 1997, the Krever commission set forth a series of recommendations for blood transfusion in Canada. These included the fundamental principles of sufficiency of supply and safety as paramount. Over the past 15 years, the blood system in Canada has undergone a series of transformations. Two new blood operators have transformed the procurement and manufacturing of blood components for Canadians. Provincial blood coordinating offices have been established in many provinces including Ontario, British Columbia, Alberta and the Maritimes. In Ontario, ORBCoN was launched to provide an organized and integrated approach to blood management including the optimization of blood utilization. Blood utilization is now a central issue for both sufficiency of supply and safety in transfusion. Ensuring the appropriate use of blood transfusions is essential to ensuring that we maintain adequate supply in face of both financial constraints and a limited donor pool. Similarly, with the decrease in transfusion transmitted infections, the largest gains in transfusion safety will be achieved through the reduction of unnecessary transfusions and the associated non-infectious complications. Critical to improved blood utilization is data on patterns of current blood use. In Ontario, there are no centralized sources of blood utilization data. Canadian Blood Services has both distribution data for blood products to hospitals and disposition data (transfused/discarded) from hospitals, but no individual patient data. Individual patient transfusion data is recorded in hospital laboratory information systems, but the data cannot be easily accessed, analyzed or combined. Without knowing who is receiving blood products and for which indications, it is hard to imagine making significant strides forward in improving utilization. To address this issue, other provinces including British Columbia and Alberta are developing centralized transfusion registries. Adopting a central transfusion registry obviates the need for time and labour intensive audits, which only provide intermittent snapshots of blood transfusion practice. Additionally, transfusion registry data could be combined with other repositories of health information to better understand the outcomes associated with blood transfusions. A central repository of patient transfusion data is required if we hope to make significant strides in blood utilization management and improve outcomes associated with blood transfusion.

A Case History: Too Much of a Good Thing?

Dr. Kerry MacDonald, Kenora Rainy River Regional Laboratory Program, Denise Evanovitch, ORBCoN SW

During influenza season, a 38 year old female arrived in the Emergency Department (ED) complaining of flu-like symptoms.

History:

- No history of heart or lung disease and is a nonsmoker
- Birth control pills for 18 years
- No history of pregnancy or transfusion
- History of heavy periods for most of her life; not currently menstruating or bleeding
- No flu vaccine this year
- Petite woman: weight estimated to be less than 50 kg

She went to work and performed her usual daily routines up until the day before she presented in the ED.

Upon admission:

Her vital signs were stable and her temperature was 38.6oC. The patient was alert and oriented, but she had pallor and demonstrated signs of early dehydration. She had exposure to influenza A at home. Tests were ordered and the patient was admitted to an isolation room pending the results. The patient did not have a family doctor and was unknown to the ED physician.

The test results were as follows:
CBC: Hb: 47 g/L with marked microcytosis
Chest X-ray (CXR) is clear
Rapid A/B flu screen: negative
O2 saturation: normal by pulse oximetry
Crossmatch for 4 units ordered: antibody screen negative and all units are compatible

All 4 units of RBCs were to be transfused overnight with saline and Tylenol administration. IV Lasix was also ordered after the second and last unit of RBCs.
The Laboratory Director made a notation on the chart about his concerns of transfusing 4 units of RBCs overnight to a non-debilitated, non-bleeding patient all in the same night. The nurses were informed of these concerns. It should be noted that there were no further charting notes from the clinical staff until the following morning.

Description of event:

At the routine morning rounds this patient had tachypnea, tachycardia, hypertension, diaphoresis and anxiety. She had no fever, but her jugular venous pressure (JVP) was elevated and a gallop rhythm was detected by stethoscope. The patient was transferred to ICU. The ECG demonstrated sinus tachycardia and the patient was investigated for an MI, which was negative. Additionally, the transfusion reaction investigation indicated no evidence of hemolysis. D-Dimer levels were normal as was the ultrasonic examination of calf veins. The CXR revealed early pulmonary edema. The patient responded to oxygen therapy, Lasix and reduction of the IV rate.
She was discharged from ICU 1 day later having a clear CXR. She was referred for investigation of heavy menses.

Discussion: What happened to this patient? Was it transfusion related? What is your evidence?
With pulmonary edema, two likely scenarios are Transfusion-Related Acute Lung Injury (TRALI) or Transfusion-Associated Circulatory Overload (TACO). How are they similar? What are the distinguishing features?

Pulmonary edema with regard to transfusion can be divided into two categories: hydrostatic edema (TACO) and permeability edema (TRALI). Additionally, TRALI cases usually present with hypotension, while TACO cases demonstrate hypertension. TACO cases occur more frequently in the elderly, infants and in individuals with hemoglobin levels less than 50 g/L. These two conditions are similar in that they both may present with a classic "white out" CXR and both cause acute respiratory distress.

Hypotension is typical of TRALI and hypertension is typical of TACO. Preliminary studies indicate that testing for B-natriuretic peptide (BNP) may be helpful in differentiating TACO from other pulmonary related transfusion events. When the BNP levels are compared pre and post-transfusion, a ratio of higher than 1.5 with a significant change of systolic BP (greater than 30 mmHg) and dyspnea, then a diagnosis of TACO is likely.

Conclusion: The investigation of this patient revealed that this was a transfusion associated event that was TACO related rather than TRALI. This small patient received a large volume of RBCs in a short period of time. Additionally, she had one of the risk factors for TACO: hemoglobin of less than 50 g/L. She presented with hypertension rather than hypotension, which is characteristic of a TACO reaction. This patient did not have any HLA or neutrophil antibodies and all four RBC units were from male donors. This hospital did not have the capability to perform BNP testing.

Questions to Ponder:

1. Are there patient safety risks in transfusing stable patients at night, weekends and off shifts? Why/why not?
2. What should be contained in policies about monitoring the transfused patient? By whom?
3. Should there be explicit instructions about large volume transfusions?
4. What is the role of your transfusion committee to educate clinical staff about the indications for transfusion and its monitoring?
5. Where would your staff look for information on adverse transfusion events and how to investigate them?
6. What is the role of BNP and possibly NT-proBNP in investigating TACO and TRALI?
7. What is the frequency of TACO and TRALI reactions?

**Answers to questions may be found at www.transfusionontario.org.

References:

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