Clinical Pathology Selected Abstracts, 3/14

Clinical pathology abstracts editor: Deborah Sesok-Pizzini, MD, MBA, associate professor, Department of Pathology and Laboratory Medicine, Perelman School of Medicine, University of Pennsylvania, Philadelphia, and medical director, Blood Bank and Transfusion Medicine, Children's Hospital of Philadelphia.

Transfusion-associated hyperkalemic cardiac arrest in pediatric patients

Hyperkalemic cardiac arrest is a potential complication in pediatric patients undergoing rapid massive transfusion. Identifying patients at particular risk for this reaction is critical for determining the best strategies to prevent transfusion-associated hyperkalemic cardiac arrest (TAHCA). Concerns arise over the use of older blood in at-risk pediatric patients. The authors examined the case reports and studies related to transfusion-associated cardiac arrest in a pediatric population. They reviewed nine case reports and six clinical studies involving massive transfusion. The authors noted that, in some cases, patients received smaller volume transfusions that resulted in TAHCA. The common factors that were associated with TAHCA in patients who received rapid transfusions were acidosis, hyperglycemia, hypocalcemia, and hypothermia at the time of arrest. The investigators also identified measures to reduce TAHCA in young children, such as anticipating and replacing blood loss before significant hemodynamic compromise occurs, using a larger bore (greater than 23-gauge) peripheral intravenous catheter in lieu of central venous lines, avoiding the use of rapid infusers, frequently checking and treating electrolyte abnormalities, using fresh red blood cells for massive transfusions in infants, reducing the plasma volume of RBC units, minimizing intervals between irradiation and transfusion, and considering washing RBCs or reducing plasma as indicated. The authors concluded that this review helped provide insight into the risk and prevention of TAHCA in pediatric patients. However, the reporting of these reactions still needs to be standardized to better identify at-risk pediatric populations.

Lee AC, Reduque LL, Luban NCL, et al. Transfusion-associated hyperkalemic cardiac arrest in pediatric patients receiving massive transfusion. *Transfusion.* 2014;54:244–254.

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Using IgM antibodies and IgG antibodies of low avidity to identify CMV infection

Infection with cytomegalovirus is a considerable risk factor for pregnant women because the virus crosses the placenta to cause congenital CMV infection. About 12.7 percent of babies infected will have symptoms at birth. Congenital CMV is the most common cause of sensorineural hearing loss and failure to meet developmental milestones. Although primary infection in the mother presents the most risk to the fetus, reactivation of maternal infection or exogenous reinfection of the mother may also occur and lead to intrauterine infection. Diagnosing primary CMV infection may be critical for identifying women who may be candidates to enroll in studies examining whether interventions can reduce transmission of CMV to the fetus. Detection of CMV-specific IgM antibodies coupled with IgG antibodies of low avidity is considered diagnostic of primary CMV infection. The authors conducted a study that focused on CMV testing and concerns about findings in pregnant women who did not follow the expected pattern of avidity testing results. The authors studied 64 pregnant women referred for avidity testing. Six study participants were identified, using the Abbott Architect assay, with positive IgM and low/equivocal avidity IgG persisting over 18 weeks. Even though the low avidity testing increased to equivocal for two women, the remaining four remained low. When their samples were retested on the Diasorin Liaison assay, two of the women with low avidity results per the Architect registered high results with Liaison. The authors noted that this raises concern that some women with positive IgM and low avidity IgG using the Abbott Architect assay may not have primary infections. The authors concluded that these findings are significant because some women may be inappropriately entered into clinical trials designed to prevent congenital CMV infection. They suggest that larger numbers of patients should be examined to determine the frequency of the testing discrepancies between the two

instruments.

Lumley S, Patel M, Griffiths PD. The combination of specific IgM antibodies and IgG antibodies of low avidity does not always indicate primary infection with cytomegalovirus. *J Med Virol.* doi:10.1002/jmv.23863.

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Safety of co-infusing dextrose-containing fluids with red blood cells

Institutional guidelines for transfusing neonates often recommend against transfusing red blood cells when the neonate is receiving electrolyte or colloid solutions. This requires that an infant fast prior to, during, and after packed red blood cell (PRBC) transfusion to mitigate the potential risk of necrotizing enterocolitis, hemolysis, or agglutination. The evidence on which these guidelines are based is limited. The authors reviewed previously published studies to determine if it is safe to co-infuse dextrose-containing fluids and PRBCs and to determine the degree of hemolysis and agglutination and adverse effects. The authors identified studies through a search of several databases. They found eight publications that were relevant to the question of whether to co-infuse PRBCs and dextrose-containing fluids. All of the studies included laboratory analysis. The authors concluded that there was only low-level evidence to support the safety of co-infusion of dextrose-containing fluids and PRBCs. They noted that it was not possible to recommend co-infusion of dextrose-containing fluids and PRBCs in the neonatal population. The practice of routinely withholding enteral feeds from preterm infants prior to RBC transfusion continues to be recommended.

Keir A, Callum J, Jankov RP. Is it safe to co-infuse dextrose-containing fluids with red blood cells? *J Paediatr Child Health.* 2013;49:687–691.

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