COMMUNICATIONS

Letter to the Editors

A hemolytic transfusion reaction due to anti-K undetected by a LISS antibody screen

Significant hemolytic transfusion reactions caused by anti-K have been reported, including a case in which the antibody failed to react using various low-ionic-strength solution (LISS) reagents.\textsuperscript{1,2} We identified an anti-K that was initially undetectable by LISS technique and that resulted in an acute hemolytic transfusion reaction.

An 84-year-old, group O-- female with a history of atrial fibrillation, permanent pacemaker insertion, osteoarthritis, and Alzheimer's dementia, underwent open reduction-internal fixation for a right hip fracture. Her transfusion history was unknown although prior transfusion was likely due to hip surgery many years ago. The preoperative antibody screen was found to be negative using LISS antiglobulin technique (N-Hance; Gamma Biologicals, Inc., Houston,TX) with a 15-minute incubation time at 37°C. Two group O-- red blood cell (RBC) units were transfused intraoperatively based on compatible immediate-spin saline crossmatch results. As per our blood bank protocol, antiglobulin crossmatches were completed for the two RBC units, although a 35-minute delay was noted due to heavy work flow at the time. One of the two units was found to be 1+ incompatible by the antiglobulin crossmatch, but the unit had been transfused prior to completion of the test.

Clinically, 6 hours after surgery and intraoperative transfusion of the two RBC units, the patient suddenly became hypoxic and unresponsive after receiving narcotic pain medication. She was given oxygen by mask and treated with narcan and sodium bicarbonate, after which she became responsive although agitated. Shortly after, scanty, dark urine was noted along with a drop in hemoglobin to 8 g/dL from 11 g/dL preoperatively, and a hemolytic transfusion reaction was suspected owing to transfusion of the incompatible RBC unit. One hour later, she became hypoxic and hypotensive (blood pressure: 70/50 mmHg), requiring intubation as well as IV fluid and renal dose dopamine supportive therapy. Two additional units of RBCs were also given. Four units of fresh frozen plasma were transfused due to disseminated intravascular coagulation, but the patient later developed ecchymoses and a left groin hematoma. The next morning, she went into cardiac arrest in the surgical intensive care unit and was pronounced dead. An autopsy was not performed.

On follow-up testing using LISS antiglobulin technique, anti-K was identified in the preoperative sample (titer of 8) with a 30-minute incubation at 37°C but was not detectable with a 15-minute incubation, confirming our suspicion that prolonged incubation time was required for detection. Testing of the hemolyzed posttransfusion sample with either 15- or 30-minute incubation time was negative, whereas the direct antiglobulin test was 1+ positive for C3d and negative for IgG; the eluate was also negative. The incompatible unit was confirmed to be K+. Increasing the serum-to-reagent RBC drop ratio from 2:1 to 3:1 and repeating the tests on the pretransfusion sample with 15- to 30-minute incubations once again yielded negative and positive results, respectively.

Although it is likely that a number of factors were involved in this patient's demise, including her underlying medical condition as well as the possible adverse effect of narcotic medication, we believe the hemolytic reaction contributed significantly. We subsequently eliminated the antiglobulin crossmatch procedure for patients with no antibody history and a negative antibody detection test. We conclude that this was indeed an example of an anti-K that was nonreactive in LISS using our routine testing procedure; however, it is possible that the initial inability to detect the antibody was due to factors unrelated to LISS, such as weakened antigen expression on the reagent screening cells after storage. Because anti-K as well as other RBC antibodies had been detected in many other cases using the same screening cell reagents maintained under the same conditions, we feel that the latter is much less likely. This case, and others like it, should serve to humble us even as we take confidence in our technologic breakthroughs and abbreviated testing procedures.

Mark T. Friedman, DO
Alan P. Cariotti, MT(ASCP)SBB
Lutheran Medical Center
Blood Bank
150 55th Street
Brooklyn, NY 11220