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## Transfusion interference by cold agglutinins

Melissa R. George and Jay H. Herman

Transfusion of an autologous unit of CPDA-1 whole blood was attempted for a 57-year-old woman after total knee arthroplasty. The patient had no other significant medical history other than severe osteoarthritis. She had requested banking a unit of autologous blood because she felt that it was safer than allogeneic blood. After surgery, the patient was transfused while she was recovering in the PACU for higher than normal amounts of bloody wound drainage. The autologous unit was hung without a blood warmer within 10 minutes after removal from the refrigerator. Flow alarms indicated an occlusion and an apparent clot was noted; this was not noticed upon retrieval of the unit from the blood bank refrigerator and the clot may have been dispersed by mixing during handling. The transfusion was stopped and the unit was returned to the blood bank. Upon inspection there were no grossly visible clots or hemolysis (see figure, left) but by this time the unit had been at room temperature for several hours. The presence of a cold agglutinin was suspected, and the unit was placed in the refrigerator and reevaluated the next day. A large aggregation of RBCs, which could not be separated by kneading, was evident (see figure, right). Plasma from the unit was sent for PT, aPTT, INR, fibrinogen, and D-dimer testing and all results were within normal limits with the exception of a slightly elevated PT of 18.2 seconds (normal, 11.1–15.5 sec). The “clot” was observed to disperse after the unit was again warmed to room temperature. An antibody screen using PEG-AGT tube method showed no reactivity at room temperature immediate spin but reactivity at 4°C was consistent with a cold agglutinin. Immediate-spin cross-matches were negative and the patient’s forward and reverse typing were valid as Group A, which argued against a cold agglutinin. Due to this inconsistency, a separate autocontrol at 4°C was performed that demonstrated reactivity. Automated CBC results demonstrated no abnormalities and a peripheral smear was not examined at the time.

This fits the clinical scenario of a cold agglutinin causing occlusion of the infusion set rather than a true clot. We informed the patient’s physician of the findings and recommended use of a blood warmer for future autologous transfusions. Cold agglutinins are common and often found in normal individuals. They are generally clinically irrelevant, but can be a nuisance in blood testing and in blood administration, as in this case. Prewarming techniques and omission of immediate-spin room temperature testing may prevent detection of cold agglutinins and other clinically insignificant cold antibodies. Use of an autologous unit of RBCs rather than whole blood could also mitigate the effects of a cold agglutinin as there would be less plasma volume and, thus, less cold agglutinin.

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#### CONFLICT OF INTEREST

The authors declare no conflicts of interest.