

Regional Registry to Reduce Delayed Hemolytic Transfusion Reactions

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Hemolytic transfusion reactions caused one quarter of the nationwide transfusion-related fatalities reported between October 2008 and September 2009.¹ One third of these involved major blood group incompatibility (e.g., A units given to Type O patients) and two thirds resulted from other blood group incompatibilities (Kidd and Kell systems antigen units given to those with corresponding alloantibodies).

Routinely, transfused patients receive alloantigen-incompatible blood because compatibility testing matches only A, B, and Rh (D) antigens. As a result, up to 10% of multi-transfused patients develop red cell alloantibodies against non-ABO antigens. In addition, women develop alloantibodies through prenatal exchange of blood between mother and fetus. Genetic differences between donors and recipients result in alloantibody formation in up to 30% of patients with sickle cell anemia.

Alloantibody titers are not constant; some dissipate over time, rendering future compatibility tests ineffective in preventing anamnestic responses and placing patients at risk for delayed hemolytic transfusion reactions following rises in alloantibody titers. To decrease this hazard, hospital transfusion services maintain records of patients with previously detected alloantibodies, lessening the chance that a person would receive cognate antigen-positive blood regardless of current test results.



Secure, Simple, Safe...Essential

However, patients may receive transfusions at more than one hospital. The Community Blood Center of Greater Kansas City established a centralized alloantibody registry to mitigate the risk of delayed hemolytic reactions for patients previously transfused at hospital A whose alloantibody titers dropped below detectable compatibility testing limits and now receive care at hospital B?

The registry links patients and alloantibodies detected by Community Blood Center's Immunohematology reference laboratory or participating hospitals. It complies with HIPAA regulations; has defined access and security; maintains eligibility criteria for entering, editing, or deleting information; and provides administrative oversight, including logs of each transaction.

The registry is Web-based, available 24 hours / 7 days per week and accessible by authorized users with assigned ID's and complex passwords. In addition to CBC, 13 of the 73 hospitals served by CBC have authorization to enter patient information. Patient alloantibody information linkage involves matching names, birth dates, ABO/Rh type. Patient records include alloantibodies detected, antigen typing and special transfusion requirements (irradiated, washed, etc.).

At the present time, the registry contains records for more than 6,000 patients. Since "going live" in June 2008, hospital transfusion services accessed the registry more than 9,000 times, by approximately 120 unique users each week. More than 4,500 of 9,000 hits (50%) provided patient information.

Several potential delayed hemolytic transfusions have been avoided. For example, the registry recorded Anti-K, -C, and -V antibodies for a patient in which the hospital transfusion service detected no alloantibodies. In other cases, registry results and hospital results found Anti-K, -E, -C versus Anti-K only; Anti-E and -Fyb versus Anti-E only; Anti-K versus no alloantibodies detected; and Anti-Lub and -S versus no alloantibodies detected.

Overall, the registry fulfills its pre-implementation goals of providing information about patients with a history of alloantibodies, reducing turnaround time for which cognate antigen-reactive blood is found, and decreasing delayed hemolytic transfusion reactions.

References:

¹ FDA. Fatalities reported to FDS following blood collection and transfusion—annual summary for fiscal year 2009.

<http://www.fda.gov/BiologicsBloodVaccines/SafetyAvailability/ReportaProblem/TransfusionDonationFatalities/ucm204763.htm>.

² Schwickerath V, Kowalski M, Menitove JE. Regional registry of patient alloantibodies: first year experience. *Transfusion* 2010 Mar 19 [Epub ahead of print] PMID: 20345565.