ANTIBODY IDENTIFICATION – Anti-Wra Case Study

A 76 year old female is admitted to your facility for knee arthroplasty. This is the patient’s third arthroplasty, and she has received RBC transfusions during each of the previous procedures. A request for type and screen and two units of RBCs crossmatched for surgery the next day are submitted to the Transfusion Services department.

Patient pretransfusion samples (Cell EDU-07 and Serum EDU-08) and segments from two donor units for crossmatch (Cell EDU-09 and Cell EDU-10) are supplied for testing.

**Expected Results**

**Patient Sample (Cell EDU-07 and Serum EDU-08):**
- Forward Group O Rh Pos
- Reverse Group O
- Antibody Screen: Positive
- Antibody Identification: Anti-K
- DAT Negative

**Donor Unit Sample (Cell EDU-09):**
- Forward Group O Rh Pos (K Negative)
- Crossmatch with Patient Serum (EDU-08)
  - AHG Compatible

**Donor Unit Sample (Cell EDU-10):**
- Forward Group O Rh Pos (K Negative, Wra positive)
- Crossmatch with Patient Serum (EDU-08)
  - AHG Incompatible (anti-Wra)

**Wra antigen and anti-Wra Discussion**

Identified in 1953 as the cause of HDN in the Wright family, the Wra antigen was included in the Diego RBC blood group system in 1995. The frequency of Wr(a+) RBCs is estimated to be 1 in 1,300 to 1 in 1,500. Anti-Wra can be present in the serum of approximately 1% of healthy people, often occurring without prior exposure to Wr(a+) RBCs. The rate of incidence increases when considering recently delivered women and patients with antibody-induced hemolytic anemia.

Since Wr(a+) cells appear only occasionally on commercially prepared reagent red cell screens and panels, it is very likely that this antibody would have been undetected in routine pretransfusion testing methods. It is also possible that the antibody would have been undetected if an unexpected alloantibody (anti-K in this case) were not discovered during pretransfusion testing, requiring antiglobulin phase crossmatch testing. Omitting the antiglobulin phase of the crossmatch if the antibody screening test is negative and there is no previous record of a positive antibody screening test was recognized as a sound practice in the early 1980s. In the tenth edition of the AABB standards (published in 1984), the standards were modified to support this practice.
Antibodies to Low Incidence Antigens

Antibodies to low incidence antigens are usually discovered after an unexpected positive crossmatch or after an incompatible transfusion which has resulted in a hemolytic transfusion reaction. The chance of an incompatible transfusion due to an antibody to a low incidence antigen has been estimated to be 1 in 1,600 to 1 in 10,000 transfusions.\(^1\) Other studies have indicated that the risk of incompatible transfusions causing serologic or delayed hemolytic transfusion reactions after immediate spin crossmatch is 1 in 1,800 to 1 in 100,000 transfusions.\(^2,3,4\)

Even if the specificity of the antibody to a low incidence antigen has not been determined, if the presence of an antibody is known, compatible units can usually be found without difficulty by antiglobulin phase crossmatch testing.

References


This case study and antibody discussion was provided by Hemo bioscience (www.hemobioscience.com), the manufacturer of these Blood Bank proficiency samples.