ANTIBODY IDENTIFICATION – Anti-C\textsuperscript{w} Case Study

A 35 year old pregnant female delivers at estimated 39 weeks gestation. The infant is slightly jaundiced and phototherapy is initiated.

Initial laboratory results:
OB workup:
Group AB
Rh positive
Antibody screen: Negative

Neonatal workup at birth:
Group A
Rh positive
Hgb: 16 g/dl
Total Bilirubin: 3.2 mg/dl
Direct Coombs: Positive

After initial review of laboratory results, a detailed history is obtained from the patient. Her husband is a visiting academic researcher and the family arrived from Finland six months prior. Unfortunately, her medical records are not readily available. By her recollection, she has no history of previous transfusions. She has two other children. The first was delivered at full term with no complications. The second was delivered at full term with slight jaundice. The jaundice was resolved by phototherapy and no transfusion was required for the infant.

Participants were asked to perform an Antibody Identification for the Educational Blood Bank Sample EDU-01. This sample contained Anti-C\textsuperscript{w} antibody.

Anti-C\textsuperscript{w} Discussion
Anti-C\textsuperscript{w} was first described in 1946 and named because of the association with C and 'W' from 'Willis', the first proband whose red blood cells carried the antigen. Most C\textsuperscript{w} positive red blood cells are also positive for the C antigen. C\textsuperscript{w} positive red blood cells exhibit a weaker expression of the C antigen due to molecular changes associated with the C\textsuperscript{w} antigen. Often naturally occurring, anti-C\textsuperscript{w} is frequently found in combination with other alloantibodies. Anti-C\textsuperscript{w} is most commonly an IgG antibody yet there have been some examples of IgM anti-C\textsuperscript{w}. Anti-C\textsuperscript{w} may cause mild to moderate hemolytic disease of the fetus and newborn (HDFN) and mild to severe immediate or delayed hemolytic transfusion reactions.

In the United States, the frequency of the C\textsuperscript{w} antigen among Caucasians is 2% and among blacks is 1%. The C\textsuperscript{w} antigen is more prevalent among Latvians (9%) and Finns (4%).
Due to the low frequency of Cw positive individuals in the United States population, a Cw positive cell is typically not included in a set of screening cells. This explains the negative antibody screen results seen with the patient presented in this case. However, the mild to moderate HDFN confirmed by the lab results of the infant (increased bilirubin, positive DAT) indicate the presence of an IgG antibody. Further information about the identification of the antibody can be determined from the ethnicity of the parents as the Cw antigen is more prevalent among Latvians (9%) and Finns (4%).

There is typically a Cw positive cell included on antibody identification panels from most manufacturers. This allows for the exclusion of other clinically significant alloantibodies. However, the identification of an anti-Cw should not be confirmed until one or two additional Cw positive cells are found to be similarly reactive. This can be achieved by testing the mother’s serum with a small selected cell panel of Cw positive cells from additional antibody identification panels or frozen rare cells.

References


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