ABID CASE #20, ANSWERS

Case study by Jim Perkins, M.D. (© 2006)

Indian Immunohematology Initiative

1. What antibody(ies) appears to be present? Is this alloantibody or autoantibody? How is this possible given the patient's blood type?

The patient has alloanti-D and anti-E. There is also a cold autoantibody of probable anti-I specificity.

The patient is Rh(D) positive so one might think the anti-D was autoantibody (see AIHA Technical case #3) but the DAT is negative. D-positive individuals can make anti-D if they have a "partial D" antigen which is missing some epitope(s) on the RHD protein. In this case the missing epitopes appear to the patient as "not-self", and the individual can make alloantibody against them. Although her antibody is only directed against an RHD epitope(s) she lacks, since all normal D antigens have that epitope(s) her antibody appears to be a normal anti-D. However, her D antigen fails to react with the anti-D made by an individual with the "group IV" type of partial D. This implies that the individual making this anti-DIV lacks the same epitope(s) of RHD that she lacks, and allows us to identify her as the same partial D, namely a DIV. In addition the patient has the low frequency Rh antigen Go^{a} which is frequently associated with DIV, and which identifies her with the DIVa variant.

2. How could your hypothesis be confirmed further?

If other DIV variant RBC examples were available to the laboratory one could test them against the patient's serum; lack of a reaction suggests that both individual's RBCs have the same form of the D antigen. Today the most direct way to confirm and characterize a D-variant would be by genotyping.

3. Discuss the variation in reaction strength with different test systems and antigen positive phenotypes.

Rh antibodies tend to react strongly with enzyme treated RBCs, often including direct agglutination at 37^{o}.and the R1R1 (D+E-) cells reacted more strongly against ficin-treated cells. Testing with ficin-treated cells is also very sensitive to cold autoantibodies, as seen in the 37^{o}, 30' reactions with D-negative cells.

4. Is this patient at risk for hemolytic transfusion reactions? Is her infant at risk for HDFN?

"Y*es" on both counts. Determination of the anti-D titer might help to guide therapy for this pregnancy.*