ABID CASE #6, ANSWERS

Case study by Jim Perkins, M.D. (© 2008)

Indian Immunohematology Initiative

1. What is the probable identity of this antibody? Is it alloantibody or autoantibody?

   Alloanti-Jk^a

2. Is any further workup needed to prove it?

   No. There are 3 Jk^a positive cells reactive, 3 non-reactive cells, the patient is Jk^a negative, and the appropriate antibodies are ruled out (anti-D, -C, -E, -c, -e,-K, -k, -Fy^a, -Fy^b, -Jk^b, -Le^a, -Le^b, -S, -s, -M, -N, -P1)

3. What is the probable source of the immunizing stimulus in this case? Why is the DAT positive?

   The transfusions 6 to 7 weeks ago were probably the stimulus for a primary immunization in this case. The mixed field positive reactions on the DAT presumably reflect the fact that a few Jk^a-positive RBCs are still circulating. Therefore, this case represents a Delayed Serologic Transfusion Reaction (DSTR) rather than a Delayed Hemolytic Transfusion Reaction (DHTR).

4. Comment on the varying strength of reactivity of the serum in the initial panel and in the various test systems used.

   Gel and LISS/tube tests were not as sensitive for detection of this anti-Jk^a as was the PEG/tube method. It is important to have Jk^a and Jk^b double dose cells if possible to screen for anti-Jk^a and anti -Jkb as shown in this case. Other methods that might be more sensitive to anti-Jk antibodies would be an IAT using enzyme-treated cells or with polyspecific anti-human globulin rather than anti-IgG since this is a complement fixing antibody as shown by the DAT. To take advantage of the letter the patient specimen would have to be fresh serum.

5. Does this antibody cause hemolytic transfusion reactions? Hemolytic disease of the fetus and newborn?

   Anti-Jk^a, even if weak in vitro, can cause severe immediate and delayed hemolytic transfusion reactions. HDFN due to anti-Jk^a is usually relatively mild.

6. How would we select compatible blood for this patient? What percentage of donors are expected to be compatible with this recipient?

   Type group O, Rh positive RBCs for Jk^a, and then crossmatch the Jk^a negative units using an indirect antiglobulin test. Twenty three per cent (23%)of Caucasian donors are expected to be compatible.

7. What is the biochemical nature of the antigen? (Review the relevant blood group system, including disease associations and population differences in antigen prevalence.)

   Kidd antigens are carried on a multipass membrane glycoprotein that acts as the urea transporter, so Jk(a-b-) individuals cannot concentrate their urine normally. The Jk^a and Jk^b proteins differ by a single amino acid. The antigens are NOT protease or DTT sensitive. African-American (A-A) individuals have a decreased frequency of Jk^b relative to European-Americans (49 vs. 74% respectively), and sickle cell disease patients frequently make anti-Jk^b. Anti-Jk^a and –Jk^b frequently fix complement, and these antibodies may be "complement dependant" in that they are detected in indirect antiglobulin tests using poly-specific anti-human globulin, but not anti-IgG. Individuals who have previously made anti-Jk^a or -Jk^b frequently cease to express detectable antibody over time, sometimes over just a few months. Because they may go undetected at the time of a subsequent transfusion, these antibodies are the most common ones causing DHTRs.