ABID CASE #19, ANSWERS

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Indian Immunohematology Initiative

1. What do you think might be causing all of the antibody screening and panel cells to be reactive? (Hint: the DAT is positive for complement on the patient's RBCs.) What would you do to investigate your hypothesis?

   As discussed in case #12, when all cells in the initial panel are reactive, we generally consider 3 possibilities including:
   1) an autoantibody (most auto-antibodies are pan-agglutinins reacting with most RBCs),
   2) an antibody against a high prevalence antigen, and
   3) antibodies of multiple specificities.
   As shown in the two previous cases (ABID #17 and #18) one might add the possibility of a gel-dependent pan-agglutination.

   In this case however, the DAT is positive with the anti-C'3 monospecific anti-human globulin, leading us to think there might be a cold autoantibody ("cold agglutinin"). So we might perform tests which would on the one hand demonstrate presence of a cold autoantibody and second, demonstrate whether there was any "underlying" alloantibody (see AIHA Technical case #1). The technologist did this quite elegantly with the next panel.

2. What antibody/ies do you think is/are present now? Are these allo- or autoantibodies? Are they proven? What must we do to prove our new hypotheses?

   The *saline tube panel still shows a panagglutinin (reactivity with all cells) but only after incubation at 14^{o}C. And of note, at this temperature the autocontrol is positive, suggesting that this cold reactivity is autoantibody. Moreover, the umbilical cord RBCs and adult group O, I-negative cell (panel cell #11) RBCs react somewhat weakly, suggesting anti-I specificity, which is very common in cold autoantibodies.*

   But at the AHG phase we antibodies with specificity, including two strong reactions with the two K-positive panel cells and weak reactions with 5 other cells, all of which are Fy^{a}-positive. It is noteworthy that the K+ RBCs are reactive at IS phase and after room-temperature incubation. Also note that the cold autoantibody is not reactive in the "prewarmed" panel, but that anti-K and anti-Fy^{a} still appear present.

   Although the cold panel demonstrates that a cold autoantibody is present, it does not prove that that is causing the positive reactions in gel. Note that even though weak cold autoantibodies were present in cases #16 and #17, they did not cause the gel reactions, which were instead explained by gel-dependant antibody. To prove that the cold autoantibody is reacting by the gel method we should do an adsorption procedure and show that they go away. A cold autoadsorption procedure would be preferable if time and enough specimen is available, or if rabbit erythrocyte stroma reagent (REST^{tm}), which adsorbs cold autoantibodies, is available we could adsorb the plasma with that.

   To prove that anti-K and anti-Fy^{a} are present we need to demonstrate reactivity of another K-positive cell in by a method in which the cold autoantibody is NOT reacting, and we need to rule out anti-E and anti-Le^{a}. We also need to show that the patients RBCs don't express K and Fy^{a}.

3. Discuss the results of the new gel panels. Did the REST adsorption work? Why did the technologist repeat the original "raw" plasma gel panel?

   The new gel panels show that REST adsorption removes the reactivity with all but the K+ and Fy^{a+} RBCs, proving the panagglutinin was a cold autoantibody. These panels have a new lot number, so presumably he wanted to show the difference with and without REST for comparable RBCs. Perhaps he had run out of cells of the original lot number.

4. What did the LISS panel demonstrate? Did it tell us anything new? Is any additional testing required?

   The LISS panel simply confirms our previous impressions. The patient's phenotype completes the identification of alloanti-K and -Fy^{a}.

5. How would one select compatible blood for this recipient? What percentage of donors are expected to be compatible?

   We would select K-negative, Fy^{a} negative group A or O RBCs and crossmatch them in our usual saline/tube test system, expecting them to be compatible at all phases of reactivity including IS. If a LISS-enhanced IAT were the laboratories standard crossmatch system, interference would again be avoided. One could also crossmatch with cold-autoadsorbed plasma or use a pre-warmed crossmatch REST adsorbed plasma cannot be used for crossmatching since the REST may adsorb ABO antibodies. Thirty per cent of Caucasian donors and 87% of African-American donors are K and Fy^{a} negative.