Case Study: Identification of Anti-Jr^a and its clinical significance in pregnancy.

Background/Case Studies:

The Jr^a antigen is a high incidence antigen expressed in >99% of all ethnicities. The Jr(a-) phenotype is found mostly in Japanese and persons of northern European descent such as those of Romani descent, but has also been reported in Bedouin Arabs and in Mexicans. The first example of Anti-Jr^a was reported in 1970 and was named after the first maker, Rose Jacobs. The antibody is more IgG than IgM in nature, may bind complement and is best identified at IAT. It is resistant to both ficin and DTT treatment. Cr cell survival studies indicated reduced RBC survival after infusion of Jr(a+) crossmatch incompatible blood. The clinical significance remains controversial, although the antibody has been associated with cases of delayed transfusion reactions and severe hemolytic disease of the newborn.

Here we present a case of Anti-Jr^a in a 34-year-old pregnant patient of Korean descent. She had no history of prior transfusions but had 2 previous pregnancies. She had a prior history of a cold agglutinin. She presented at 10 weeks gestation with a stable Hgb of 14.7g/dl. A pre-natal sample was submitted to the Immunohematology Reference Laboratory (IRL).

Study Design/Methods:

The patient tested B positive with a negative direct antiglobulin (DAT) and a positive antibody screen. Testing of her plasma demonstrated 1+ reactivity at LISS-IAT and 2+ reactivity at PEG-IAT with all reagent panel cells. Reactivity was resistant with Ficin treatment. An antibody to a high incidence antigen was suspected. Selected cells negative for high incidence antigens were tested at PEG-IAT resulting in nonreactivity with two Jr^a negative cells. The patient's red cells were tested with two sources of unlicensed Jr^a anti-sera and were also found to be nonreactive. A pre-natal titration was performed at saline-IAT and yielded a titer of 256 and a score of 51. Allogeneic adsorptions, with cells of known phenotype, were performed to exclude additional alloantibodies.

A second sample was submitted at 24 weeks gestation. The patient's Hgb was 12.4g/dl. A second pre-natal titration was performed and yielded a result of 512 and a score of 80. A monocyte monolayer assay (MMA) was performed with a result of 11.8-12.6% (normal range <5%), indicating the anti-Jr^a could cause accelerated clearance of Jr(a+) red blood cells.

Results/Findings:

Monocyte Monolayer Assay (MMA):

	IAT	MMA
Patient serum + Jr(a+) RBCs	**2+**	**12.6%**
Patient serum + fresh normal serum + Jr(a+) RBCs	**2+**	**11.8%**
Patient + Jr(a-) RBCs	**0**	**3.7%**
Patient + fresh normal serum + Jr(a-) RBCs	**0**	**1%**

Conclusions:

Anti-Jr^a was identified using standard tube techniques. Results obtained from the MMA testing indicated the antibody to be clinically significant. The physician requested four PRBCs (packed red blood cells) be on standby for delivery. A search was conducted through the American Rare Donor program, but no suitable donors were in the United States. The patient was monitored closely and delivered a healthy baby by C-section with minimal blood loss. Postdelivery Hgb was 10.7 g/dl. Patient was encouraged to donate autologous units post recovery, for future transfusion needs.

This study provided epidemiology support of anti-Jr^a antibody in those persons of Korean descent.

References:

Reid, Lomas-Francis. The Blood Group Antigen FactsBook. Third Edition, 2012.