Prevalence and Specificity of Clinically Significant Red Cell Alloantibodies in Pregnant Women According to ABO and Rh D type - A Study from a Tertiary Care Hospital in Southeast Michigan

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Background

Maternal red cell IgG antibodies can cross placenta and cause hemolysis of fetal red blood cells (RBCs) in case of antigenic difference between maternal and fetal RBCs leading to hemolytic disease of the fetus and newborn (HDFN). More than 50 red cell alloantibodies are known to cause HDFN and are considered clinically significant. Although the incidence of anti-D associated HDFN has drastically reduced with Rh immune globulin (RhIG) prophylaxis, HDFN due to other maternal alloantibodies still remains a concern.

Objectives

To determine the prevalence and specificity of clinically significant red cell alloantibodies amongst pregnant females who delivered at Beaumont Hospital Royal Oak between May 1, 2017 and December 31, 2017.

Methods

4548 pregnant females were screened using the Beaumont Health electronic medical records. One female above the age of 50 years, and two females with invalid ABO type were excluded from the study per IRB approved protocol. The remaining 4545 pregnant females with a valid ABO/Rh D type and a valid red cell antibody screen were included.

Results

440 out of 4545 pregnant females had a positive red cell antibody screen. Of these 440 females, 34 had clinically significant alloantibodies, giving an overall prevalence of 0.74%. The most frequently identified significant alloantibody was anti-E (n=13) followed by anti-K (n=7) and anti-M (n=6). Most frequent significant alloantibody in Rh D positive and Rh D negative females was anti-E and anti-K respectively. 0.5% of blood group O, 1% of group A, 0.7% of group B and 1.3% of group AB pregnant females had clinically significant alloantibodies.

Conclusion

Our study aims to reinforce the importance of red cell antibody screening during pregnancy. Minimizing the exposure of females of child bearing age to incompatible red cell antigens through unnecessary transfusions can reduce the incidence of red cell alloimmunization and the risk of HDFN.