

Maternal RBC alloantibodies in pregnancy.

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Individuals with multiple antibodies were alloimmunized after first or subsequent pregnancies. Alloimmunization of red blood cells in pregnancy is a challenge to clinicians. Maternal Immunoglobulin G (IgG) antibodies are the main cause of fetal red cell hemolysis [1]. Maternal alloimmunization following exposure to allogeneic RBCs during pregnancy or blood transfusion results in hemolytic disease of the fetus and newborn (HDFN). The prevalence of maternal RBC alloimmunisation is unclear and newborns affected by maternal RBC alloantibodies may have prolonged anemia after birth, and this issue may lead one to question that, whether maternal alloantibody transfer may take place out of the placenta [2]. It seems that, theoretically maternal anti-RBC IgA alloantibodies may also be transferred in human breast milk and so result in consequence in some infants under some circumstances [2]. In spite of the fact that Rh immune globulin (RhIG) plays an important role in prevention of anti-D hemolytic disease of the fetus and newborn, HDFN due to anti-D and by non-D antibodies still are a serious concern. Among 50 RBC alloantibodies that lead to HDFN, anti-D, anti-c and anti-K having the highest probability of causing severe HDFN respectively, and also anti-D is the most common and severe cause of immunization [3]. The prevalence of alloantibodies in pregnancy has been reported in different countries [4,5] and also we have reported this prevalence in Iranian pregnant women in our recent study [6]. We believe that an assessment of such a data from pregnant women and also from thalassemia patients helps to monitor pregnancies with antibodies that may put embryos at the risk of HDFN.

In Iran, like other developing countries, during pregnancy period alloimmunization screening tests are performed just on D negative women to detect anti-D. The most of developing countries have a national guideline for screening all pregnant women for irregular RBC antibodies, but despite the academic teaching offered in the text to the obstetrical and gynecology, there is a lack of such guidelines in many countries to follow and detect unexpected red cell alloantibodies. In several European countries, there are guidelines to recommend Rh(D) prophylaxis for all Rh(D) negative pregnant women unless the father of the fetus is Rh(D) negative [7]. An universal health insurance can play an important role at affordable prices in national programs for Rh(D) immunoglobulin to prevent alloimmunization to Rh(D) antigen, Rh immunoprophylaxis during pregnancy. Of the important subjects that should be considered, is improper management of patients during pregnancy by not screening the possible risk of any alloimmunizations during multiparous pregnancy, absence of

correct test to the determine exact number of RhIG doses needed for injection in Rh(D) negative mother with Rh(D) positive child and lack of follow up for post RhIG injection effectiveness. It is now well known and confirmed that, preventional programs for anti-D alloimmunisation and HDFN should be considered seriously.

References

1. Dajak S, Stefanović V, Čapkun V. Severe hemolytic disease of fetus and newborn caused by red blood cell antibodies undetected at first-trimester screening (CME). *Transfusion*. 2011;51:1380-8.
2. Santhanakrishnan M, Tormey CA, Natarajan P, et al. Clinically significant anti-KEL RBC alloantibodies are transferred by breast milk in a murine model. *Vox Sang*. 2016;111:79-87.
3. Gottvall T, Filbey D. Alloimmunization in pregnancy during the years 1992–2005 in the central west region of Sweden. *Acta obstetrica et gynecologica Scandinavica*. 2016;87:843-8.
4. Jeremiah ZA, Mordi A, Buseri FI, et al. Frequencies of maternal red blood cell alloantibodies in Port Harcourt, Nigeria. *Asian J Transfusion Sci*. 2011;5:39.
5. Koelewijn J, Vrijkotte T, Van der Schoot C, et al. Effect of screening for red cell antibodies, other than anti-D, to detect hemolytic disease of the fetus and newborn: a study in the Netherlands. *Transfusion*. 2008;48: 941-952.
6. Shahverdi E, Moghaddam M, Gorzin F. Maternal red blood cell alloantibodies identified in blood samples obtained from Iranian pregnant women: the first population study in Iran. *Transfusion*. 2017;57: 97-101.
7. Bichler J, Schöndorfer G, Pabst G, et al. Pharmacokinetics of anti-D IgG in pregnant RhD-negative women. *BJOG: An Int J Obstetrics & Gynaecology*. 2003;110:39-45.

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