

Study of the Phenotype of Red Blood Cells of Rh-Negative Pregnant Women

A. B. Saidov, I. Y. Masharipova

Republican Blood Transfusion Center, Urgench Branch of Tashkent Medical Academy, Uzbekistan

Abstract The article examines the phenotype of Rh-negative erythrocytes of pregnant women who applied to the RBTC. The results of the study showed that 7 variants of phenotypes were found in the studied pregnant women: the most common phenotype was dccee – 75.7% of cases. In second place is the dccEe phenotype – 14.8% of cases. Further, the phenotype is dCcee – 4.5% of cases. The remaining 4 variants of phenotypes are rare.

Keywords Erythrocyte phenotype, Rh-negative pregnant women

1. Relevance of the Topic

The provision of Rh-negative pregnant women with donor blood is an urgent problem of modern medicine. In Uzbekistan, this problem is still the most urgent, given that, firstly, the birth rate is increasing every year, and secondly, anemia in fertile age women, although it has decreased, is one of the reasons for complications of pregnancy and childbirth, and thirdly, the shortage of Rh-negative blood donors [1]. Moreover, the modern principle in transfusiology is not to transfuse compatible blood groups, but to transfuse identical blood by antigens, which further aggravates the issue of providing donor blood but prevents posttransfusion complications [2,3,4].

Given the above, the purpose of our study is to study the phenotype of Rh-negative erythrocytes of pregnant women.

2. Materials and Methods of the Study

The blood of 202 pregnant women who applied to the immunological laboratory of the RBTC was examined. The age of women is from 20 to 34 years. Blood samples of pregnant women were examined for group affiliation according to the ABO system by a cross-method using monoclonal antibodies, standard erythrocytes, and Rhesus antigen D was detected with the help of Soliclon AntiD Super (Hematologist LLC, Moscow), additionally examined for the presence of variant and weak forms of antigen D using monoclonal antibodies anti-RH1(D)/RhW1 in the Coombs reaction. All blood samples of pregnant women were tested for the presence of the Kell antigen using anti-K Super monoclonal antibodies (Hematologist LLC, Moscow).

3. The Results Obtained and Their Discussions

The results of the study showed that 7 variants of phenotypes were found in the studied pregnant women: the most common phenotype was dccee – 75.7% of cases. In second place is the dccEe phenotype. This phenotype was found in 14.8% of cases. Further, the phenotype – dCcee, was found in 4.5% of cases. The remaining 4 variants of phenotypes were rare. These are the dccEeK phenotype – 2.5% of cases, the dcceeK phenotype – 1.5% of cases, the dCcEe phenotype, and the dCCee phenotype – 0.5% of cases each. According to the AB0 system, the blood groups of Rh-negative pregnant women were distributed in the following sequence: II – 35%, I – 33%, III – 24%, IV – 8%. (Table 1)

dccee – 75.7% the largest number of Rh-negative pregnant women are more likely to be sensitized by Rh-positive fetal erythrocytes (the natural way of immunization). In the absence of antiresus antibodies (full and incomplete forms) after each delivery, it is recommended to inject 1 dose of antiresus RhoD immunoglobulin during the first 48 hours, no later than 72 hours after delivery, if the baby is born positive [5].

dccEe – 14.8% The phenotype contains antigen E, which can be protective during pregnancy. Such women are less likely to have natural immunization. "E" – as a Rhesus positive donor, as a recipient – Rhesus negative.

dCcee – 4.5% The phenotype contains antigen C, which can also serve as a protection against natural immunization during pregnancy. Antigen "C" is transfusionally dangerous. In case of donation of donated blood, it is suitable only for Rh-positive recipients, i.e. as a Rh-positive donor, as a Rh-negative recipient.

dccEeK – 2.5% the phenotype contains an antigen of the Kell system, which also belongs to the

transfusion-dangerous. Erythrocytes containing antigen K can be transfused only to recipients who contain this antigen. There is a risk of natural immunization with K antigen during pregnancy.

dcceeK – 1.5% is the same.

dCCee is a 0.5% rare phenotype in Rh-negative pregnant women and recipients. Contains two transfusion-dangerous antigens "C" and "E". In the case of blood donation, only Rh-positive recipients are suitable.

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Table 1. The phenotype of erythrocyte of Rh factor minus in pregnant women

Phenotype	The types of blood				Total	%
	I	II	III	IV		
Dccee	51	56	33	13	153	75,7
dccEe	10	7	11	2	30	14,8
dCcee	4	2	3	-	9	4,5
dccEeK	-	3	1	1	5	2,5
dcceeK	1	2	-	-	3	1,5
dCcEe	1	-	-	-	1	0,5
dCCee	-	-	1	-	1	0,5
Total	67	70	49	16	202	100
%	33	35	24	8		100

4. Conclusions

Thus, the conducted studies of the phenotype of Rh-negative erythrocytes of pregnant women have shown their peculiarities, in that the dccee phenotype is mainly found and is transfusion safe. On the other hand, about 25% of cases in Rh-negative pregnant women have transfusion-dangerous antigens - C, E, and even Kell. In order to prevent a conflict on the rhesus system during the transfusion of blood components, especially in pregnant women, it is mandatory to carry out phenotyping – the definition of C, C, E, E., and Kell.

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