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Prognosis of the Risk of Sensitization in RH-Negative Pregnant Women

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Abstract

There are difficulties in predicting RH sensitization of a pregnant woman with RH-negative blood with a RH-positive fetus. The aim of the study is to predict the risk of sensitization depending on the anamnestic data, the characteristics of the course of pregnancy and the set of RH factors and subfactors of the mother and father.

2 groups of pregnant women with RH-negative blood were studied. In the first group (36 women), there were signs of hemolytic disease (GB) in newborns, and in 26 cases, it was absent. A scale for predicting the risk of RH-sensitization was developed, the use of which showed high specificity (94.1%) and sensitivity (88.4%).

Keywords: *Pregnancy; RH-Negative Blood; Hemolytic Disease*

Introduction

One of the difficult issues of immunological interaction between a RH-negative mother and a RH-positive fetus is the prediction of the development of hemolytic disease (GB) of the fetus and the newborn [3].

According to V. M. Sidelnikova and A. G. Antonov (2004), sensitization occurs on average in 10% of RH-negative women, of which only 1% of newborns develop hemolytic disease. Currently, there are three types of main RH factors: D, C, E and three identical subfactors d, C, and E. each person has their own individual set of RH factors and subfactors [1-3]. a Certain combination of RH factors of the mother and the fetus should undoubtedly influence the degree of sensitization of the mother's body.

Taking into account that there are no widely available prognostic systems for determining the probability of RH-sensitization of women, we developed a scale for predicting the risk of RH-sensitization in pregnant women with RH-negative blood and set the goal of determining its effectiveness.

Materials and Methods

62 birth histories of RH-negative women who did not receive specific prophylaxis with anti-rhesus immunoglobulin were analyzed Retrospectively. In 36 cases (group 1), newborns showed signs of hemolytic disease of varying severity, and in 26 cases (group 2), there were no signs of hemolytic disease. In the first group of women, the average age was 27.4 ± 0.8 years. Material and methods: 62 birth histories of RH-negative women who did not receive specific prophylaxis with anti-rhesus immunoglobulin were analyzed Retrospectively. In 36 cases (group 1), newborns showed signs of hemolytic disease of varying severity, and in 26 cases (group 2), there were no signs of hemolytic disease. In the first group of women, the average age was 27.4 ± 0.8 years. The first birth was in 12 people, 7 of whom had a

history of medical abortions between 7 and 10 weeks of pregnancy. In four women, previous births ended with the birth of children with signs of GB, for which two newborns underwent replacement transfusion of red blood cell mass and plasmapheresis. In 32 cases, delivery occurred on time and in 4 (11.1%) cases it was premature between 33 and 36 weeks of pregnancy. During pregnancy, 15 (41.7%) women were treated for the threat of termination at various times. The first birth was in 12 people, 7 of whom had a history of medical abortions between 7 and 10 weeks of pregnancy. In four women, previous births ended with the birth of children with signs of GB, for which two newborns underwent replacement transfusion of red blood cell mass and plasmapheresis. In 32 cases, delivery occurred on time and in 4(11.1%) cases it was premature between 33 and 36 weeks of pregnancy. During pregnancy, 15 (41.7%) women were treated for the threat of termination at various times Two of them pregnancies ended in premature birth. Signs of Feto-placental insufficiency after 30 weeks were observed in 8 (22.2%) pregnant women, herpes simplex virus carrier in 31, preeclampsia or increased blood pressure in 26 (72.2%). Pronounced preeclampsia was detected in 2 women whose labor was completed surgically prematurely due to progressive intrauterine fetal hypoxia, against the background of long-term preeclampsia. In 19 (52.8%) cases out of 36 no antibody titer was detected during pregnancy. In 17 (47.2%) women, the antibody titer during pregnancy ranged from 1:4 to 1: 36. The coincidence of blood groups in the mother and father of newborns was noted in 27 (75%) observations.

Of the 36 newborns with hemolytic disease, 25 (69.4%) had a mild form with anemic syndrome and 11 (30.6%) of moderate severity with severe jaundice-anemic syndrome Edematous form of hemolytic disease was not detected in any observation. Most (34) newborns were born with an Apgar score of 6 to 8. Only 2, after operative delivery, had an Apgar score of 5 (13.9%). At birth, 3 (8.3%) children showed signs of mild hypotrophy. In the second group (26 people) of women who have newborns born without signs of hemolytic disease, the average age was 22.3 ± 1.2 years. The first births were in 18 people. None of the women (7 people) had hemolytic disease of newborns during the previous birth. Medical abortions with a history of 6 to 11 weeks were detected in 14 women. In three cases, the number of abortions was more than 2. In 3 (11.5%) cases, spontaneous miscarriages occurred at 14, 7 and 9 weeks of pregnancy. There was no threat of termination of pregnancy in any of the observations. Herpes simplex virus carriers were observed in 4 (15.4%) women, signs of AFN in 4 (15.4%) and moderate preeclampsia during 37 - 38 weeks of pregnancy in 1 (3.8%) woman who was delivered by caesarean section with premature discharge of amniotic fluid and lack of readiness of the birth canal for delivery. None of the women in this group had an antibody titer during pregnancy. The coincidence of the mother's and husband's blood groups was found in 41 (15.4%) cases At the same time, in 2 cases, children were born with RH-negative blood group. All newborns of this group of women were born with RH-negative blood group. All newborns of this group of women were born with an Apgar score of 6 to 8 points. In the process of analyzing the information received, we developed a scale of risk of RH-sensitization with a point rating depending on the significance of each of the factors. So, the coincidence of the blood groups of the wife and husband was estimated at 3 points, the RH-positive mother of the wife-0.5 points, the carrier of a viral infection-2 points, clinical and paraclinical signs of AFN in 1 point,

The threat of termination of pregnancy-1.0 point, Detachment of the normally located placenta-1 point, preeclampsia of a pronounced degree-1 point homozygous set of husband's antigens (DDcE, DDCe, EEcc) in 5 points, if the mother has E and the husband has SS, or the mother has C, and her husband has 5 points and the definition of complete antibodies (M) in 5 points(M). The average score was calculated using the formula: the sum of points was divided by the number of risk factors. The average number of points ≤ 1, 5 was regarded as low risk, from 1, 51-1, 99 points-average risk, and from 2, 0 to 2, 45 points - high risk.

Results

The degree of sensitization was Assessed at 22 - 24 weeks of pregnancy, 30 - 32 weeks, and 36 - 37 weeks. When ultrasound signs of fetal hemolytic disease appeared, regardless of the antibody titer level, the degree of sensitization was assessed as severe. Also, the degree of sensitization was assessed as severe when any antibody titer appeared before 20 weeks of pregnancy. To assess the degree of sensitivity and specificity, we conducted a retrospective assessment of the risk of sensitization using the proposed method in 52 RH-negative women, from whom we were able to obtain complete information on the criteria we were interested.

Of the 52 women, the antibody titer was absent during pregnancy in 17 people, was no more than 1: 16 in 23, did not exceed 1:32 in 8, and was more than 1:32 in 4 pregnant women. The coincidence of the risk of sensitization and prognosis of 52 women was observed in 46 (88.4%), and of 35 sensitized women in 32 (91.4%).

Thus, the proposed mathematical model for assessing the risk of sensitization in RH-negative women had a fairly high degree of sensitivity (88.4%) and specificity (91.4%).

Conclusion

The proposed system for predicting the degree of sensitization has a sufficient degree of sensitivity and specificity, which allows it to be used in practical obstetrics.

The evaluation criteria of this system are available for institutions of any level, which increases the possibility of predicting sensitization.

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