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OBSTETRIC OUTCOMES IN WOMEN WITH RH IMMUNIZATION

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Abstract:

Among the current problems of practical obstetrics, one of the most important places is occupied by the problem of immunoconflict pregnancy. Starting from the first weeks of pregnancy, complex immunobiological relationships arise between the embryo and the maternal body, which largely determine the further course of pregnancy, the condition of the mother, and the development of the fetus and newborn. The cause of the development of hemolytic disease of the fetus and newborn is immunization of the maternal body with fetal red blood cells containing antigens that are absent in the mother. Most often this refers to the Rh system (95%), less often to the AB0 system and other antigenic factors of erythrocytes. The Rh factor begins to form at 7-8 weeks of pregnancy and is clearly visible in the fetus at 10-14 weeks. A necessary condition for the development of hemolytic disease of the fetus and newborn is the passage of fetal red blood cells through the placental barrier into the mother's bloodstream. In this case, the first entry of fetal erythrocytes containing Rh0 (D) into the mother's bloodstream leads to her sensitization, that is, to the production of antibodies, and the second one may be accompanied by a Rh conflict, that is, an antigen-antibody reaction, which is the basis for the development of HDN.

Keywords: Hemolytic disease of the fetus, hemolytic disease of the newborn, Rh immunization, Rh sensitization, isoimmunization.

The most significant in the development of Rh immunization is blood transfusion without taking into account the Rh factor, but for an individual patient, each of these factors can cause the initial entry of fetal red blood cells containing the Rh factor into the mother's bloodstream. During physiological pregnancy, fetal red blood cells penetrate the placenta in 3% of women in the first trimester, in 15% of women in the second trimester, in 45% of women in the third trimester of pregnancy. During pregnancy, Rh immunization contributes to the disruption of the integrity of the chorionic villi, resulting in the entry of fetal red blood cells into the mother's bloodstream. The intensity of the process of destruction of red blood cells is judged by the titer of antibodies to red blood cell antigens, that is, the higher the titer, the more intense the hemolysis of red blood cells and the more severe the form of HDN. The problem of Rh-conflict pregnancy, just like the problem of HDN, has not only a medical, but also a social aspect: in 87-92% of women with Rh-negative blood, who did not receive immunoprophylaxis with anti-Rhesus immunoglobulin after the first pregnancy, subsequent pregnancies ended in repeated losses children and psychological trauma for both parents (2).

THE PURPOSE of the study was to study the characteristics of the course of pregnancy and childbirth, as well as perinatal outcomes in patients with Rh-conflict pregnancy.

MATERIALS AND METHODS OF RESEARCH: we conducted a retrospective analysis of 86 birth histories of patients with Rh-sensitization at a gestational age of 22 to 39 weeks, hospitalized in the regional perinatal center for maternal and child health in 2020-2022. In the process of analyzing birth histories, special attention was paid to the features of clinical and anamnestic data, highlighting risk factors for the development of tension-type headache, and identifying a history of blood transfusions, spontaneous miscarriages, antenatal fetal losses, stillbirths, births of children with hemolytic disease, who underwent exchange transfusions, etc. .d. Particular attention was paid to determining the blood group, Rh factor and the dynamics of Rh antibodies, as well as the presence of group immune antibodies to identify the combination of Rh and group incompatibility. Ultrasound data in the dynamics of pregnancy were taken into account, including

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fetometry, assessment of ultrasound markers of HDP: fetal hepatomegaly, placentomegaly, increased amount of amniotic fluid, as well as signs of the edematous form of HDP (ascites, hydrothorax, hydropericardium, double contours of fetal soft tissue).

Particular attention was paid to Doppler measurements (assessment of blood flow in the umbilical cord artery and blood flow velocity in the MCA based on angle-independent indicators), as one of the informative markers of the severity of TTH.

Research results and discussion. An analysis of the risk factors that led to Rh sensitization in the remaining women showed that 8 of them had a history of blood transfusion without taking into account the Rh affiliation of the blood, 66 women had a history of artificial and spontaneous abortions (mainly in the first trimester), 29 had a history of labor with the birth of children with HDN; 11 had a history of antenatal fetal death due to the edematous form of HDN. The obstetric history was aggravated in 73 women, including spontaneous miscarriages in 42 patients, 31 patients had a history of non-developing pregnancies in the first trimester. It should be especially noted that specific prevention of hemolytic disease by administering anti-Rhesus immunoglobulin after previous pregnancies was not carried out in any case! Titers of Rh antibodies during this pregnancy ranged from 1:4 to 1:4096. When comparing antibody titers and the severity of HDN, it was found that in most cases there was a direct relationship between the degree of maternal isoimmunization and the severity of the disease in the fetus: with a low titer (from 1:4 to 1:16), most often children were born without HDN (12) or with mild form of hemolytic disease (17). When high titers of Rh antibodies fluctuated (from 1:16 to 1:4098), children were born with moderate to severe forms of HDN (53 children) and perinatal losses were noted (5).

A study of the nature of changes in Rh antibody titers in the dynamics of pregnancy showed that a "monotonic" level of Rh antibody titer was noted in 16 pregnant women, a "jumping" titer was detected in 26 patients, and we found an increasing nature of the Rh antibody titer in 19 patients. Most rarely, a decreasing titer of Rh antibodies was detected (in 6 patients). It should be noted that at the birth of children with moderate tension headache, the monotonous nature of the dynamics of antibody titer was most often noted. But in cases of birth of children with severe HDN, the dynamics of changes in the level of Rh antibodies was more of an increasing and "jumping" nature. A decreasing titer of Rh antibodies (in 18 cases) was typical for children born without HDN.

We identified the following blood group in 86 examined patients: blood group II (A) was more common (39.4%), somewhat less common - I (O), III (B) and IV (AB) (25.7, 19.3 and 15.6% respectively). Children mainly inherited their mother's blood type (71.2%).

Multigroup-incompatible combinations were observed in 28.8%. Our data confirm the existing point of view that Rh-conflict pregnancy often proceeds favorably if the mother and fetus have different blood groups (2.3), since in our observations in 87% of cases with moderate and severe icteric form, as well as in 93% of cases with the edematous form of hemolytic disease, pregnancy was compatible in a group sense, more often in group II (A).

In addition to studying the titer of Rh antibodies in the diagnosis of HDP, the role of the echographic method of assessing the condition of the fetus as well as Doppler blood flow in the utero-placental system, in particular the blood flow velocity in the middle cerebral artery of the fetus, is undeniable. When conducting an ultrasound (with Doppler measurement of the fetal middle cerebral artery) study of pregnant women with Rhesus immunization, taking into account the pathogenetic mechanisms of development of erythroblastosis fetus, the following criteria were assessed: thickness of the placenta, amniotic fluid index, height of the fetal liver, vertical size of the fetal spleen. Blood flow velocity in the middle cerebral artery was monitored in 100% of pregnant women. In 64 (74%) pregnant women with pathological Doppler parameters, a high level of antibodies was detected (from 1:64 to 1:4096), while 20 (30.5%) of them had high levels of blood flow in the MCA, and ultrasound showed 42 (54.9%) pregnant women had markers of hemolytic disease of the fetus: increased volume of the placenta, polyhydramnios, hepatomegaly, ascites. Today, due to technological progress, approaches to solving the problems of hemolytic disease in Rh-conflict pregnancy are being optimized. This concerns the development of informative non-invasive markers for diagnosing the severity of TTH based on Doppler blood flow in the middle cerebral artery of the fetus, which underlies a timely solution to the issue of intrauterine blood transfusion (IUT), which helps prevent fetal death.

A high degree of correlation of blood flow velocity in the MCA with the level of fetal hematocrit has been proven, which makes it possible to timely diagnose fetal anemia and resolve the issue of intrauterine blood transfusion to the fetus. In our observations, in 18 pregnant women, blood flow in the MCA reached critical values (above 1.5 MoM), which was an indication for diagnostic

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cordocentesis, which confirmed the presence of fetal anemia. Therefore, in all these cases, intrauterine blood transfusion was performed to the fetus. Subsequently, the fetuses continued to monitor blood flow velocity in the MCA at intervals of 3-5 days. A total of 13 blood transfusions were performed in 9 fetuses. The interval between blood transfusions ranged from 5 days to 5 weeks. All patients whose fetuses underwent blood transfusions were delivered within the period from 31-32 to 35-36 weeks. Birth through the birth canal was in 7, surgical delivery by cesarean section in 2 pregnant women.

An analysis of pregnancy complications in patients with Rh-sensitization showed that the most common threat of miscarriage was: in the first trimester in 26 (30%) pregnant women; in the second trimester in 25 (28.3%), a chronic threat of miscarriage (in the first – second – third trimesters) was noted in 18 (20.2%) women. 34 (38.7%) women suffered from early toxicosis in pregnancy; preeclampsia of moderate and mild severity was diagnosed in 24 (27.2%) patients. It is necessary to note the high incidence of anemia in pregnant women with Rh sensitization, which amounted to 42.7% (in 37 women). The problem of choosing a method of delivery in Rh-conflict pregnancy has not yet been fully resolved. In severe forms of HDN at 32-34 weeks of pregnancy, a cesarean section is preferred in the interests of the fetus. In moderate and mild forms of HDN, it is possible to prolong pregnancy under the control of ultrasound and Doppler measurements of blood flow velocity in the MCA and conduct delivery through the natural birth canal. In our observations, pregnancy ended with timely birth at 37-39 weeks in 38 (45%) women.

Childbirth proceeded without any peculiarities in 27 (69.2%) pregnant women, in 12 (30.8%) complications of labor in the form of weakness of labor were noted; prenatal rupture of amniotic fluid, fetal hypoxia, hypotonic bleeding. Surgical delivery (caesarean section) occurred in 43 (50.8%) patients; indications for operative delivery were: severe form of HDP and unprepared birth canal in 21, uterine scar in 9, abnormal fetal position in 9, premature rupture of water in combination with unprepared birth canal in 6, VPC in severe HD in 4, placenta previa 2. Analysis of the outcomes of operative delivery, especially in severe forms of HDP, allows us to consider this method of choosing delivery justified and we should completely agree with the opinion of G.M. Savelyeva et al that, regardless of the preparedness of the birth canal, the position of the fetus and concomitant pathology, a cesarean section should be performed for the edematous form of hypertension, severe icteric form, as well as for all patients who have undergone VPC.

Of the 86 newborns born, 13 had an Rh negative blood factor, the remaining 73 were born with HDN of varying severity. Perinatal losses occurred in 6 cases, of which 2 were stillborn at 27-28 weeks of pregnancy, the reason was the severe condition of the fetus due to the edematous form of HDP; 5 newborns died in the first days of life (at 29-31 weeks); all the dead showed signs of a severe form (icteric or edematous form) of HDN. 32 newborns were born with the icteric form of HDN, of which 17 had a mild course and did not require replacement blood transfusion (RBT); 11 newborns had a moderate-severe course, and 5 had a severe course of the icteric form of headache. 20 newborns were born with an anemic form of HDN. The remaining 15 newborns were diagnosed with the edematous form of HDN. Newborns with a severe, moderately severe course, as well as an edematous form of hemolytic disease were treated in the intensive care unit, all of them received a replacement blood transfusion. Thirty-one children with HDN received a single POC; the issue of repeated replacement blood transfusion was decided depending on the hourly increase in bilirubin levels. 24 newborns required two-time POC; Three-time POC was performed in 4 newborns. Children with mild forms of HDN were observed in the neonatal department with phototherapy and infusion therapy. All children were discharged home on days 9-14 in satisfactory condition.

CONCLUSIONS: 1. Among the main risk factors for the development of Rh immunization are blood transfusions without taking into account Rh affiliation and the lack of specific prophylaxis by administering anti-Rh immunoglobulin after previous pregnancies. 2. In the diagnosis of HDP, determining the presence and magnitude of Rh antibody titers does not lose its importance. At the same time, in the prognosis of severe forms of HDP, an important role is played by the "monotonic" or "jumping" nature of the dynamics of the titer of Rh antibodies. 3. The most informative non-invasive marker for diagnosing the severity of HDP is Doppler blood flow in the middle cerebral artery of the fetus. The use of this technique made it possible to timely resolve the issue of VPC and prevent fetal death in 10 patients with severe hypertension. 4. The course of pregnancy and childbirth in patients with Rh sensitization was accompanied by a large number of complications, and a high frequency of premature and operative births was noted. 4. 74 newborns (85.6%) were diagnosed with TTH of varying severity. Perinatal losses occurred in 6 cases; in all cases, fetal death was

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caused by a severe form of HDN. 64 newborns with severe forms of HDN underwent POC. 5. In solving the problem of HDPiN in immunoconflict pregnancy, an important role is played by timely prevention of sensitization by administering anti-Rhesus immunoglobulin to all primiparas with Rh-negative blood factor, as well as women who have had an induced or spontaneous abortion, an ectopic or non-developing pregnancy, and especially those who have undergone a blood transfusion without taking into account the Rh factor blood.

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