CLINICAL AND BIOCHEMICAL INDICATORS OF HEMOLYTIC DISEASE OF NEWBORNS

Ibragimova Nadiya Sabirovna,
Isakulova Muhabbat Mardanovna
assistants at the Department of Clinical and Laboratory Diagnostics with a course of clinical and laboratory diagnostics at the Faculty of Postgraduate Education,
Abduzhalolova Firuza Abduazizovna
cadet of the Department of Clinical and Laboratory Diagnostics with a course of clinical and laboratory diagnostics of FOPE, Samarkand State Medical University, Uzbekistan, Samarkand

КЛИНИКО-БИОХИМИЧЕСКИЕ ПОКАЗАТЕЛИ ГЕМОЛИТИЧЕСКОЙ БОЛЕЗНИ НОВОРОЖДЕННЫХ

Ибрагимова Надия Сабировна,
Исакулова Мухаббат Мардановна
ассистенты кафедры Клинико-лабораторной диагностики с курсом клинико-лабораторной диагностики ФПДО,
Абдужалолова Фируза Абдуазизовна
курсант кафедры Клинико-лабораторной диагностики с курсом клинико-лабораторной диагностики ФПДО, Самаркандского Государственного Медицинского Университета, Узбекистан, Самарканд

Annotation. The article discusses current problems of obstetrics and neonatology, in particular hemolytic disease of newborns. Hemolytic disease of newborns is a common cause of miscarriage, complications during childbirth and the perinatal period. The level of bilirubin, hemoglobin and reticulocytes in the blood of newborns was determined.

Key words: hyperbilirubinemia, hemolytic disease of newborns, Rh conflict, biochemical parameters, reticulocytosis.

Аннотация. В статье рассматриваются актуальные на сегодняшний день проблемы акушерства и неонатологии, в частности гемолитической болезни новорожденных. Гемолитическая болезнь новорождённых является частой причиной прерывания беременности, осложнений в родах и в перинатальном

периоде. Произведено определение уровня билирубина, гемоглобина и ретикулоцитов крови новорождённых.

Ключевые слова: гипербилирубинемия, гемолитическая болезнь новорожденных, резус-конфликт, биохимические показатели, ретикулоцитоз.

The purpose of the study is to identify clinical and biochemical blood parameters that change in various forms of hemolytic disease of newborns.

The material for the study is venous blood of newborns.

Research methods: photometric and non-cyanide hemoglobin method.

During the last decade, the incidence of morbidity in newborns has increased significantly. An analysis of the nature of morbidity and the structure of early neonatal mortality shows that causes such as neonatal infection and pathology caused by inadequate assistance during childbirth have ceased to be the leading causes of morbidity and mortality in newborns [2, 7, 15]. Currently, a special role is given to the significance of fetal pathology, which subsequently leads to disruption or impossibility of adaptation of the newborn to extrauterine life. Hemolytic disease of the newborn and fetus has a great influence on the structure of neonatal morbidity and mortality - a disease of newborns caused by an immunological conflict due to the incompatibility of the blood of the mother and fetus with regard to erythrocyte antigens [2, 5,16].

Among newborn diseases, hemolytic disease occupies a special place. Having various clinical manifestations, the pathology is characterized by an intense increase in the level of conjugated bilirubin, which leads to damage to the central nervous system and other organs, as well as permanent disability or death. Currently, significant advances have been made in the treatment of icteric forms of hemolytic disease of newborns, but this, unfortunately, does not apply to the edematous form of HDN, which develops as a result of Rh conflict [1, 4, 14]. One of the main activities of modern medicine is to reduce not only perinatal mortality, but also perinatal morbidity. These indicators are influenced by cases of hemolytic disease of the fetus and newborn [3, 6, 8, 13]. Despite the well-studied causes of the development of hemolytic disease of the newborn [2, 9, 10], significant difficulties in its treatment still exist. The developed tactics for the treatment of hemolytic disease in the postnatal period are largely aimed at eliminating hyperbilirubinemia and preventing possible encephalopathy. The rational use of conservative treatment led to a decrease in the incidence of exchange transfusion in newborns with hemolytic disease, but could not completely eliminate the need for exchange transfusion in HDN [3, 11, 12].

Results and discussion. During the study, 162 newborns were examined, of which the experimental group consisted of 142 newborns with hemolytic disease: 27 (19%) with Rh-conflict and 115 (81%) with incompatibility of ABO system antigens, and 20 newborns from the neonatal department represented the control group.

During the observation, the following laboratory parameters were analyzed: total bilirubin level, hemoglobin level, number of red blood cells and reticulocytes.

In all newborns with hemolytic disease, the concentration of total bilirubin in the blood serum was determined in the first hours after birth (from the umbilical cord vein) and over time at least twice a day until it began to decrease (with calculation of the rate of increase in the concentration of bilirubin in the blood). In the first five days of life, newborns were examined daily to determine the level of hemoglobin and count the number of erythrocytes and reticulocytes.

Studies have shown that Rh-conflict tension-type headache was severe in 63% of cases (17 out of 27). Moderate severity of the disease was diagnosed in 23% of cases (6) and mild in 14% (4).

Rh-conflict HDN is characterized by the early appearance of hyperbilirubinemia. According to our observations, in 22 out of 27 cases, the appearance of icteric discoloration of the skin is noted in the first 24 hours of life, including in 15 infants - in the first 6 hours. With ABO-THB, jaundice was diagnosed in 17 out of 115 newborns in the first 6 hours of life.

Indicators of red blood of newborns at birth (hemoglobin, red blood cells) correspond to age standards. Reticulocytosis (more than 43%) was detected in moderate and severe hemolytic disease of newborns with Rh incompatibility.

When the conflict regarding antigens of the ABO system was realized, a mild form of the disease was diagnosed in 49 newborns (42.6%) out of 115, moderate – in 44 (38.3%) and severe – in 22 (19.1%). When a hemolytic conflict occurs based on antigens of the ABO system, a mild form of hemolytic disease is more often diagnosed. A conflict over antigens of the ABO system is characterized by the appearance of jaundice at the end of the first day of a child’s life - in 89 out of 115 cases. Indicators of red blood of newborns at birth (hemoglobin, red blood cells) correspond to age standards. Reticulocytosis (more than 43%) was detected in moderate and severe hemolytic disease of the newborn.

Severe tension-type headache developed more often in the case of a conflict in the Rh system antigens (63.0%) than in the case of a conflict in the ABO system antigens (39.0%). In newborns, hemolytic disease with incompatibility with ABO antigens predominates (81%) over Rh conflict (19%). The most important symptom characterizing TTH is hyperbilirubinemia. It is detected at different times both in infants with Rh-conflict tension-type headache and in cases of conflict according to the ABO system. Jaundice in newborns appears primarily on the face, most noticeable in the area of the nose and nasolabial triangle. At the beginning of the disease, the baby's face is always more jaundiced than the body. This is due to the thin skin on the face, the presence of developed subcutaneous fat and better blood supply to the tissues in this area. The development and course of HDN has its own patterns: the conflict is

realized in newborns already from the first pregnancy in case of conflict according to the ABO system or from a second pregnancy in case of Rh-conflict.

The severity of Rh-conflict HDN directly depends on the titer of maternal Rh antibodies and the matching of the blood groups of the mother and the newborn. The most important symptom characterizing various forms of HDN is jaundice. With Rh-conflict hemolytic disease, its early appearance was noted in 55% of newborns, in the first 6 hours of life. The early appearance of jaundice, in the first 6 hours of life, is diagnosed with Rh-conflict HDN more often (55.6%) than with ABO-HDN (14.8%). In case of ABO-THB, jaundice was detected in 77.3% of the observed patients at the end of the first day of life. In 84.3% of cases, hyperbilirubinemia that appeared early and increased in intensity was the only clinical sign (monosymptom) of tension-type headache.

Conclusions. Based on the results of the observation, the following conclusions can be drawn:

- in all forms of hemolytic disease of newborns, reticulocytosis, anemia and hyperbilirubinemia are observed;
- Rh-conflict hemolytic disease of newborns is characterized by a reduced level of red blood cells, due to their increased breakdown, and an intense increase in bilirubin in the first 12 hours after birth, which very often leads to replacement blood transfusion;
- for hemolytic disease of newborns according to the ABO system, the following is characteristic: the number of red blood cells is within the age norms and the increase in bilirubin, which requires treatment with phototherapy, but does not require replacement blood transfusion.

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