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RISK FACTORS OF FORMATION THE PERINATAL LESIONS OF NEWBORNS

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Resume

Purpose of the study - is study the features of clinical manifestations and unconditional reflexes of newborns with small weight, also estimate the content of microelements of newborns, with a complication of anemia during the pregnancy. There were inspected 20 full-term newborns with small weight and 35 newborns with normal weight. Unsatisfactory conditions of fetal development in mothers with anemia manifested by birth newborns with small weight, damaging of the nervous system, decrease in the functional characteristics of organism of newborns during childbirth and the early neonatal period.

Keywords: newborns, microelements, prenatal development.

ФАКТОРЫ РИСКА ФОРМИРОВАНИЯ ПЕРИНАТАЛЬНЫХ ПОРАЖЕНИЙ У НОВОРОЖДЕННЫХ

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Резюме

Цель исследования: изучить особенности клинических показателей и безусловных рефлексов у маловесных новорожденных, оценить уровень содержания микроэлементов у новорожденных детей, при осложнении периода беременности анемией.

Материалы и методы: обследованы 20 доношенные новорожденные, родившиеся с малым весом и 35 новорожденные с нормальным весом и их матери.

Результаты: Неудовлетворительные условия развития плода у матерей с анемией проявляется рождением их с малым весом, поражением нервной системы, снижением функциональных характеристик организма новорожденных во время родов и раннем неонатальном периоде.
Ключевые слова: новорожденные, микроэлементы, рождение с малым весом.

ЧАҚАЛОҚЛАРДА ПЕРИНАТАЛ ЖАРОҲАТЛАРНИ ШАҚЛЛАНТИРУВЧИ ҲАВФЛИ ОМИЛЛАР

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Тошкент педиатрия тиббиёт институты

Резюме

Тадқиқот мақсади - камвазнлик билан туғилган чакалоқларда клиник белгиларни ва шартсиз рефлексларни хусусиятларини ўрганиш, ҳамда оналарда ҳомиладорлик анемия билан асоратланганда, чакалоқларда микроэлементлар миқдорини аниқлаш.

Материал ва услувлар: 20 та етилиб камвазнлик билан ва 35 та нормал вази билан туғилган чакалоқлар текширилди.

Натижа ва хулоқа: Оналарда ҳомиладорлик анемия билан кечганида ҳомиланинг ривожланиши учун қониқарсиз шароит юзага келиб, чакалоқларнинг камвазнлик билан туғилған қузатилади, эрта неонатал даврда асаб тизимининг зарарланишига, тананинг функционал кўрсаткичларини пасайиш қушилган.

Калит сўзлар: яна туғилган чакалоқлар, микроэлементлар, камвазнлик.

Relevance

Among the various risk states of neonatal morbidity in the neonatal period, an important place belongs to physical disorders and damage to the central nervous system (CNS), which is the result of various pathological conditions in a pregnant woman [5]. Postponed anemia in women during pregnancy, various other diseases of the mother lead to chronic secondary failure of the placenta, fetal hypoxia, as well as an imbalance of trace elements, which, by changing the functioning of enzymes and other proteins, reduce the intensity of metabolic processes in the fetus [1,4,9].

Fetal and newborn hypoxia is a condition in which, under the influence of acute or chronic oxygen deficiency and metabolic acidosis, the functions of vital body systems are disrupted [2,3]. The most severe disorders develop in the central nervous system, cardiovascular, and respiratory systems. Recent epidemiological studies
indicate the leading role of brain lesions that have arisen in the perinatal period, which are currently diagnosed in 85% of full-term and almost 100% of premature babies, they form further neurological and somatic pathology, disability and social maladjustment ++ children [5,7]. Statistics show that perinatal lesions of the central nervous system account for up to 80% of all neurological diseases of childhood [2].

Currently, there are serious discussions on the prevalence, diagnosis of perinatal encephalopathy, as well as approaches to the treatment and rehabilitation of children. According to the WHO expert committee, encephalopathy is a transient and unclassified state of the brain of non-inflammatory genesis. This term is accepted all over the world, but it is often discussed and criticized.

According to domestic authors, perinatal encephalopathy is a collective diagnosis, implying a violation of the function or structure of the brain of various origins, which arose in the perinatal period [5, 13].

The authors of foreign and domestic literature noted the fact that the level of interaction of the body's regulatory mechanisms, metabolic and functional adaptive mechanisms underlies the response of the fetus to a damaging effect from the outside, adaptation during childbirth and adaptation to outside uterine life. Fetal and newborn hypoxia is a condition in which, under the influence of acute or chronic oxygen deficiency and metabolic acidosis, the functions of vital body systems are disrupted [5,12]. Changes at this level occurring in the first hours, days outside the uterine existence, are further realized in pathological conditions and diseases. The second group of factors primarily includes environmental impacts, pathology of the mother-woman, pregnancy, childbirth, acquired diseases of the newborn and the quality of medical care [5,12]. The research revealed the features of the autonomic nervous system, respiratory, digestive, cardiovascular, musculoskeletal systems in children with lesions of the central nervous system. It was found that these children in the future form a group of frequently ill, more prone to chronic disease [6,9]. They often have skin and respiratory allergies, as well as deviations in physical development, which often manifest themselves in the form of underweight and short stature, as well as an
increase in neurological morbidity and disability, which gives rise to serious concerns for the fate of the younger generation and the socio-economic development of the country in the whole [8].

The aim of the study was to study the features of clinical indicators and unconditioned reflexes in low birth weight infants, to assess the level of some trace elements in newborns, with the physiological course of pregnancy and its complication by anemia.

Material and methods

We examined 25 infants born with low birth weight (MV) from mothers with anemia (group 1). The control group consisted of 35 practically healthy full-term newborns with normal weight (HB) from mothers without anemia (group 2). Complete anthropometry, clinical and neurological examination of children, the severity of certain pathological signs, as well as determination of the content of trace elements (ME) in the serum of the umbilical cord blood were carried out.

Result and discussion

It was found that by all clinical parameters, children with low weight are inferior to newborns with normal weight (Table 1). In terms of weight, children with HB are significantly higher by 931.1 grams than children with CF (3370.6 ± 2.19 and 2439.5 ± 0.87, respectively).

Table 1.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Newborns with NV from mothers without anemia n = 35</th>
<th>Newborns with CF from anemic mothers who took FSP n = 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth weight (g)</td>
<td>3370.6 ± 2.19</td>
<td>2439.5 ± 0.87</td>
</tr>
<tr>
<td>Apgar score for 1 min. (points)</td>
<td>7.1 ± 1.07</td>
<td>6.8 ± 2.02</td>
</tr>
<tr>
<td>Apgar score for 5 min. (points)</td>
<td>8.1 ± 0.94</td>
<td>7.7 ± 1.59</td>
</tr>
<tr>
<td>Physiological jaundice (days)</td>
<td>2.7 ± 0.37</td>
<td>6.6 ± 0.41</td>
</tr>
<tr>
<td>BMI</td>
<td>12.6</td>
<td>10.7</td>
</tr>
</tbody>
</table>

Note: * - reliability between the indicators of the compared groups (p <0.001).
Particular attention is paid to studies of the unconditioned reflexes of newborns - the Moro reflex, sucking, searching, mouth-mouth and protection. According to the above indicators, children of group 2 turned out to be in the best position, where the skin color at birth is pink in 75% of children, unconditioned reflexes of newborns are preserved in 65% and actively suckles the mother's breast also in 75% of children. In children with CF from mothers with anemia, the rates were much lower - 55%, 25% and 45%, respectively.

In the 2nd group of children, cyanotic pink color of the skin is found in 9 newborns (25.7%), Moro's reflex is reduced in 8 newborns (22.8%), exhausted in 4 newborns (11.4%) and spontaneous in 3 newborns. (8.6%). The indicator of decreased activity of breastfeeding was observed in this group in 4 newborns (11.4%) and weak activity in 3 newborns (8.6%). In the 1st group of newborns, the cyanotic pink color of the skin is found in 17 newborns (68.0%), the Moro reflex is reduced in 12 newborns (48.0%), depleted in 7 newborns (28.0%) and spontaneous in 6 newborns. (24.0%). The indicator of decreased activity of breastfeeding was observed in this group in 14 newborns (56.0%) and weak activity in 9 newborns (36.0%). Literature data indicate that conditions that involve damage to the central nervous system are on average 20.4%. The leading reasons for the formation of disability in childhood are diseases of the nervous system - 20.6%. The use of modern medicines, medical technologies in combination with the effective organization of care for newborns in critical conditions allows to reduce mortality in this category of patients [5, 12].

Assessment of the state according to the Apgar scale indicates reduced rates in these children with CF at birth. At 1 and 5 minutes, it was 6 and 7 points in 8 children out of 25 newborns born with CF (32.0%), and in 3 children, 5 and 6 points (12.0%). The majority of children have 52% scores of 7 and 8 points, only one child has 8 and 8 points (4%). In group 1, almost all children had an Apgar score of 7-8 points.

The hemoglobin content in the blood of practically healthy full-term newborns with NV averaged significantly 191.5 ± 5.8 g / L, in newborns with CF it was relatively
lower by 25.6 g / L and amounted to 165.9 ± 3.9 g / L. 1, 15 out of 25 children showed a decrease in hemoglobin in the blood, i.e. anemia (60%).

In the study of the ME content, special attention was paid to the indicators of iron and calcium. The study of iron in the umbilical cord blood in the studied groups of newborns with NV reveals that normal cord blood contains an average of 139.35 ± 0.35 μg / ml of iron; in the group of children with CF, 98.66 ± 0.62 μg / ml (Table 2).

The iron content in the human body is on average 4.2 g. About 75% of its total amount is part of the hemoglobin of erythrocytes, which carry oxygen from the lungs to the tissues [13, 14]. Of the total amount, 20% of iron is reserved (bone marrow, liver, macrophages), 4% is part of myoglobin, about 1% is contained in respiratory enzymes that catalyze respiration in cells and tissues, as well as in other enzymatic structures [10, 14].

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>139.35 ± 0.35</td>
<td>98.66 ± 0.62</td>
</tr>
<tr>
<td>Calcium</td>
<td>55.37 ± 0.50</td>
<td>42.23 ± 0.25</td>
</tr>
</tbody>
</table>

Note: * - reliability between the indicators of the compared groups (p < 0.001).

These data once again indicate the importance of the role of trace elements in the etiopathogenesis of anemia [6]. The role of ME in the etiopathogenesis of anemias is not always adequately assessed, and the main role is often assigned only to the gland. A decrease in the concentration of a number of vitamins and trace elements of cobalt, manganese, zinc, chromium, copper, selenium, iodine, contribute to the development of anemia in the body [12, 13].

Analyzing the average content of umbilical cord blood calcium in the studied group of newborns with NV from mothers without anemia, it was found that its content is 55.37 ± 0.50 μg / ml. In the group of newborns with CF from mothers with anemia, it is 42.23 ± 0.25 μg / ml. As D. Bosscher D. and Van Cauwenbergh R. points out, hypocalcemia during the first two days of life can be detected in about 30% of low birth weight or
children born in asphyxia and in 50% of children [10, 11]. Approximately the same data are given by Roughead Z. K., Zito C. A.: in a third of children, for the first time days of life, hypocalcemia can be found in a state of severe asphyxia [14].

A drop in the level of Ca in the blood leads to an increase in the internal secretion of the parathyroid glands, i.e. an increase in blood flow, excitability of the central nervous system. Calcium is the main element in the formation of the skeletal system, therefore, its decrease leads to a decrease in synthetic processes in the child's body, which is manifested by a delay in growth and development.

The severity of violations of microelement homeostasis in newborns depends on the duration of anemia and diseases in pregnant women, and the lack of essential ME coincided with the degree of fetal and newborn malnutrition, which confirms the degree of participation of ME, especially Ca, in the formation of the body [9,13].

As a result of the studies carried out, the pathological distribution of iron and calcium is revealed against the background of anemia and low birth weight, which indicates a disruption of the adaptive and compensatory mechanisms of the mother and child's body. Based on the studies carried out, it should be noted that the deficiency or imbalance of ME in mothers and newborns is a frequent cause of intrauterine fetal growth retardation, anemia, impaired central nervous system functions in newborns and adaptation of children in the early neonatal period.

Output

Thus, the analysis of clinical signs and studies of the nervous system in newborns indicate unsatisfactory conditions for the development of the fetus in mothers with anemia, which is manifested by the birth of children with CF, damage to the nervous system, and a decrease in the functional characteristics of the body in the early neonatal period. The rational use of mineral components, especially iron and calcium, is a prerequisite for the correct growth and development of the fetus, which determines the state of its systems and organs.
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Entered 03.08.2020