THE FEATURES OF THE CLINIC AND DIAGNOSIS OF INTRAUTERINE PNEUMONIA IN NEWBORNS (LITERATURE REVIEW)

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Abstract. This article focuses on the variety of clinical manifestations of intrauterine pneumonia in newborns, including premature infants. The clinical picture of early and late intrauterine pneumonia is presented. The features of the methods of examination of the respiratory organs, such as percussion and auscultation in newborns, are given. The article presents the material of the course of pneumonia which is based on etiological factors and manifested by specific clinical features. The main methods of diagnosis of intrauterine pneumonia such as instrumental and laboratory which is used in newborns are indicated.

Key words: newborns, intrauterine pneumonia, clinic, diagnosis.

Clinical characteristics of intrauterine pneumonia in newborns, especially in premature babies, are quite peculiar. It is connected with anatomical, physiological and immunobiological features, immaturity of the respiratory and central nervous systems of a premature baby, as well as the inferiority of protective mechanisms and violations of tissue barriers [1, 2]. In the first day of life, the clinical picture of intrauterine pneumonia in premature newborns is identical to that of respiratory distress syndrome [3]. In each individual case, the specifics of the implementation and course of pneumonia depend on the individual reaction of the child to the etiological factor, the nature and virulence of the pathogen, the degree of bacteremia, the severity of intoxication, gestational age, hypothermia and other factors [1, 4].

Intrauterine pneumonia in newborns is divided into early and late pneumonia [4]. It is known that the manifestation of clinical signs of pneumonia in the first three days after birth is characteristic of early intrauterine pneumonia. Most of them include bacterial pneumonia. If there was no hypoxia during the birth act, then the newborn may be born with an Airdag score of 8-8 points. At the same time, it is difficult to diagnose intrauterine pneumonia immediately after childbirth, because the child's condition is satisfactory [1, 5].

The first signs of respiratory disorders in such children appear approximately 3-4 hours after birth, and in some of them they can be clinically determined only after 24-36 hours [6, 7, 8].

The start of clinical features of respiratory distress syndrome is observed from birth, but there may be manifestations after some time (the first 6 hours of life) [3, 7, 8].

The clinic of late intrauterine pneumonia (mainly chlamydia, ureaplasma, mycoplasma) in a child may first appear 7-14 days after birth [4, 8].

For intrauterine pneumonia caused by group "B" streptococcus, an early onset is indicative (in about 90% of cases). Such pneumonia is characterized by the development of pathology in the first or second day of a newborn's life with a very high mortality rate [7].

Characteristics of signs of intrauterine pneumonia are the early appearance of respiratory disorders such as an increase of frequency (more than 60 per minute) and respiratory rhythm disturbances, episodes of apnea, retraction of the supple places of the chest, central cyanosis, the appearance of expiratory moaning.
(grants). Some children may have an increased body temperature at the end of the first day of life. One of the early concomitant signs of pneumonia in newborns is pronounced the early dysfunction of the gastrointestinal tract, which is characterized by an increase of the residual contents in the stomach, often with an admixture of bile [3, 9].

In newborns with intrauterine pneumonia is heard weakened breathing with a large number of small-bubbly and crepitating wheezes during auscultation of the chest. As the pathological process progresses, the amount of sputum increases, usually purulent. At the same time, the child's condition is rapidly deteriorating. There are symptoms of depression of the central nervous system and violation of hemocardiodynamics. The color of the skin acquires a dirty gray shade, often jaundice is added. There is a decrease in appetite and tolerance to enteral nutrition [4, 6, 8].

A more favorable course of intrauterine pneumonia in newborns has been observed if clinical signs of the disease appear on the 3rd - 10th day of life. At the same time, the progression of respiratory failure and violation of the general condition of the child occurs gradually, and severe changes in hemocardiodynamics and metabolism are not observed [4, 9, 10].

With generalized intrauterine infection, clinical manifestations of intrauterine pneumonia with respiratory distress are already detected in the first minutes of life. Usually asphyxia joins and such newborns need primary resuscitation [2, 8, 11].

Even if the first breath in this condition occurs without delay, then from the very first minutes the newborn has shortness of breath, noisy breathing and progression of respiratory failure. At first, pallor with a grayish tinge is expressed, and then total cyanosis. Muscle hypotension and decreased reflexes are determined. The muffled or deafness of the heart tones and lethargy are expressed. The enlarged liver and spleen are palpated, regurgitations are appeared. There is an initial decrease in body weight by 15-30% with a slow recovery. Temperature increase in premature newborns in the first 2-3 days of life is rare and is associated with the immaturity of the thermoregulation centers [4, 10, 12].

If the child was infected at the time of delivery, then his condition may be satisfactory. Respiratory disorders and an increase in body temperature appear only on the 2-3 day of life. It is possible to attach diarrhea, purulent conjunctivitis, and sometimes pustular skin lesions [1, 5, 13].

Chlamydia acquired intranatally manifests clinically after 7 to 10 days of life with purulent conjunctivitis. There is shortness of breath and an oppressive cough, which leads to regurgitation and vomiting, attacks of cyanosis. Stridor and wheezing breathing are possible. There are no signs of infectious toxicosis. Body temperature is within normal limits. Over time, oitis media and rhinitis may develop. The general condition of the child is severe. Eosinophilia was recorded in blood tests. X-ray examination of the chest organs revealed the diffuse lung swelling, small focal infiltrates against the background of reticular-small nodular lesions of interstitial tissue. With the exclusion of cross-infection, a favorable outcome of the disease is predicted [1, 9, 14, 17].
Streptococcal “B” infection is characterized by an early onset of clinical manifestations. If the process is realized on the first day of life, then 1/3 of children are diagnosed with septicemia; the same number of newborns have pneumonia in combination with meningitis and a similar number of examined children have increasing severity of pneumonia. Most of the infected kids are premature babies born with obstetric complications during childbirth. Children with a birth weight of less than 1000 g have the highest frequency of streptococcal “B” pneumonia. At the same time, the clinical picture is similar to respiratory distress syndrome. The course of such a disease is sometimes manifested by fever or hypothermia, arterial hypotension. There may be bloating, pallor of the skin and mucous membranes. The deep depression of the central nervous system from the first minutes of life is marked. There is rapid and noisy breathing, apnea attacks, cyanosis or pallor. Radiologically, pneumonia is very often diagnosed as a drain, in the future as destructive pneumonia. However, there are cases when radiologically it does not differ from respiratory distress syndrome 9, 18, 19, 20.

With colibacilar pneumonia, the formation of abscesses and necrosis of lung tissue is possible. Radiologically, it is treated as a small focal or drain. Against the background of severe toxicosis, the symptoms of central nervous system arousal dominate. At the same time, there is a general anxiety of the child, repeated regurgitation and vomiting, weak sucking and a decrease in body weight. Muscle hypertonus is pronounced, but at the same time reflexes of the newborn period are reduced. Arterial hypotension and anemia are presented. The pallor of the skin is pronounced, often jaundice. Body temperature ranges from subfebrile to febrile digits. There are attacks of cyanosis sometimes. The boundaries of relative cardiac dullness are expanded percussionally. Heart tones are muted auscultatively. There is an abundance of wheezing in the lungs. The liver is enlarged under palpation. Disseminated, intravascular coagulation syndrome often occurs. Kidney damage and diarrhea are often diagnosed in newborns. The course of the disease is prolonged with prolonged respiratory support, massive antibiotic and immunotherapy. The prognosis is more often favorable with adequate treatment, [5, 9, 14, 18].

Pseudomonas Aeruginosa is considered as one of the manifestations of sepsis. It is characterized by necrotic skin changes and pronounced intoxication. There is a depression of the central nervous system in the form of lethargy, sluggish reaction to examination, decreased muscle tone and reflexes. Regurgitation and vomiting are noted. The onset of coma is possible. Body temperature is often normal or subfebrile. Hypothermia is developed in most children. In blood tests are presented anemia, leukopenia, normal or moderately accelerated erythrocyte sedimentation rate. Usually the course of pneumonia is destructive with the formation of many small abscesses. The nature of sputum is mucopurulent or purulent, greenish in color with a specific odor in large quantities. Hemorrhagic disorders are observed. The prognosis for life is often unfavorable [2, 10, 14, 18].

With klebsiella pneumonia in newborns, there is a slow progression of the process with the development of compaction of the lung tissue. A small amount of wheezing is detected auscultatively, which is explained by the abundant exudation of viscous mucus and which clogs the alveoli and small bronchi. Percussion data is more informative in this case. Extensive necrotic and hemorrhagic changes in the lungs are presented. There is lobar infiltrate with protruding cavities. There may be abscesses and pyothorax. Body temperature rarely rises. Leukocytosis is in the blood, erythrocyte sedimentation rate is increased [12, 14, 16, 18].

The diagnosis of intrauterine pneumonia in newborns includes an anamnesis with a detailed analysis of "infectious" risk factors in the mother before and during pregnancy, during childbirth as well as a dynamic assessment of the clinical condition of newborns from the first minutes of life, the time of occurrence and the nature of the development of respiratory disorders [10, 19]. However, clinical experience shows that currently there is no such test that has 100% sensitivity and specificity in detecting early neonatal infection [5, 6, 18].

To confirm the diagnosis, the neonatologist uses the following diagnostic criteria in his work: basic and auxiliary. Confirmation of the diagnosis of intrauterine pneumonia is considered established if one main or three (or more) auxiliary diagnostic signs are identified [1, 4, 8, 14, 18].

The main signs include radiologically confirmed focal and/or infiltrative shadows; obtaining identical flora from the respiratory tract or blood of the child and the birth canal of the mother; confirmation of pneumonia during a pathoanatomical autopsy, if the death occurred in the first 3 days of the child's life [8, 16, 12, 18, 20].

Auxiliary signs are as follows: leukocytosis above 21 G / l, rod-shaped shift of the formula - more than 11% (taking into account blood collection on the 1st day of life); thrombocytopenia < 170 G / l; negative dynamics in the blood test after 24 hours of life; an increase in the level of C-reactive protein in the blood in the first 3 days of life; the amount of Ig M in umbilical cord blood > 21 mg %; positive procalcitonin test in the first 2 days of life; purulent sputum from the first intubation of a newborn in the first 3 days of life (smear microscopy); X-ray confirmation of a pronounced broncho-vascular pattern and/or a local decrease in the transparency of pulmonary fields; the presence of inflammatory fluid in the pleural cavities, from the 1st day of life (hydrothorax); enlargement of the liver and spleen; the appearance of other purulent-inflammatory foci in the newborn in the first three days of life; inflammatory changes in the placenta [1, 5, 9, 11, 14, 19].

A number of authors indicate that if intrauterine pneumonia is suspected in a newborn, it is a sign that the so-called septic examination should be carried out, which includes a general blood test with a differential number of leukocytes, platelets, blood culture for sterility, C-reactive protein studies [1, 7, 21, 22].
Other authors [4, 5, 6, 14, 17] recommend conducting a clinical blood test with a count of leukocytes and platelets (the first day of life) with a dynamic study, if intrauterine pneumonia is suspected. In the literature data, it is noted that congenital pneumonia is characterized by: leukocytosis (> 20.0 × 10 G/l) or leukopenia (< 5.0 × 10 G/l), an increase in the leukocyte index of neutrophils (> 0.2), a decrease in the number of platelets (< 150,000 G/l).

Currently it has been proven that blood culture cannot serve as an "ideal standard" for confirming congenital pneumonia in children, since it was established on autopsy of newborns with sepsis that only 81-82% had a positive blood culture during life.

In addition, the introduction of infection during blood culture is not excluded [14, 17].

It is necessary to take into account in making a diagnosis the positive result of microscopic (color by Gram) and bacteriological examination of sputum which is obtained during the rehabilitation of the tracheo-bronchial tree under direct laryngoscopy or from the endotracheal tube [2, 11, 12, 18].

An informative and accessible method [14] is considered to be Gram staining of nasopharyngeal or tracheal aspirate, stomach in a newborn taken within 8 hours after birth.

Quantitative determination of C-reactive protein in the blood remains among the diagnostic markers of bacterial infection (including intrauterine pneumonia) in newborns. Most likely, this acute-phase indicator is not affected by such perinatal conditions as a long anhydrous period, asphyxia, respiratory distress syndrome, jaundice [4, 6, 9, 18].

It was found that in the first 6 to 8 hours of life of a child with bacterial intrauterine infection, the content of C-reactive protein increases and after 24 hours has a maximum value (in some cases, 20-100 times higher than the initial values). The decrease in the level of this acute phase indicator begins with 3 days from the beginning of effective treatment of bacterial infection and only by the 6th-10th day it comes to normal [7, 22]. It is recommended to study the C-reactive protein several times in dynamics, since obtaining its negative result after 24 hours is estimated by prognostically significant (99%), which allows to cancel antibiotics as soon as possible [1, 3, 9, 22].

Other authors [11] indicate in studies that the concentration of C-reactive protein in the blood had only a weak correlation with the realization of early neonatal infection in a newborn. Probably in this case, the direct influence of the general state of the mother on the synthesis of acute-phase protein is important.

The modern diagnostic and informative method of confirming severe bacterial infections in newborns is to determine the level of procalcitonin on 1-3 days of life [23].

The classic way to diagnose intrauterine pneumonia remains an X-ray examination of the chest organs. In order to clarify the nature and localization of the inflammatory process, it is necessary to perform two or three shots in the early stage of pneumonia with an interval of 1-3 days until the stabilization state [4, 9, 16, 20].

Radiologically there are focal, segmental, lobar, unilateral and bilateral pneumonia. Pneumonia is characterized by infiltrative shadows (drained or finely dispersed); almost always there is a noticeable increase in the bronchovascular pattern and peribronchial infiltration is determined. Some types of pneumonia (for example, intrauterine pneumonia caused by group "B" streptococcus) have a reticulogranular or nodular network. It was found that the lung X-ray performed during the first 24 hours of life does not reveal characteristic changes in 20-30% of cases [5, 6, 16, 18].

According to X-ray signs respiratory distress syndrome is divided into four degrees of severity [3, 9, 11, 20]. A triad of radiological signs of respiratory distress syndrome has been recognized, such as diffuse foci of reduced transparency, air bronchograms, and reduced pneumatization of lung tissue [8, 20].

In premature newborns with combined pathology (intrauterine pneumonia + respiratory distress syndrome) it is difficult to establish whether the radiographic signs of inflammation are a new process or a worsening of the underlying disease [6, 9, 18, 20]. In the first 24 hours of life in premature newborns, even radiologically, it can be difficult to make a final diagnosis in favor of intrauterine pneumonia or respiratory distress syndrome, since the clinical manifestations are similar [3, 9, 19, 20, 24, 25].

Shabalov N. P. (2009) notes that respiratory distress syndrome is very difficult to distinguish from pneumonia caused by hemolytic streptococcus group "B". It is assumed that these competing conditions are presented in premature infants with severe clinical manifestations. That’s why newborns with a preliminary diagnosis of respiratory distress syndrome begin to be treated with antibiotics [18, 24, 25, 26].

There is another diagnostic difficulty to differentiate respiratory distress syndrome from persistent pulmonary hypertension of newborns on the one hand, and on the other hand, there is a congenital heart defect of the blue type [3, 14, 18, 27]. In order to solve this issue, a test with the use of constant positive pressure in the respiratory tract is recommended [9, 18, 24]. Thus, the use of constant positive pressure (8-10 cm of water column) when breathing with 100% moistened oxygen for 10 minutes, as a rule, increases RaO2 to 100 mmHg or more. If a newborn has congenital heart disease or persistent pulmonary hypertension, then RaO2 practically does not change. In the future, a hyperoxia and hyperventilation test is used to differentiate persistent pulmonary hypertension and congenital heart disease in newborns [18, 24].

In addition, the differential diagnosis of intrauterine pneumonia is carried out with other causes of respiratory distress such as congenital lung and heart defects, aspiration, diaphragmatic hernia, etc. [4, 12, 14, 18, 19].

So, taking into account the spread and severity of the prognosis of intrauterine infections in newborns (especially premature infants), one of the important tasks of modern neonatology and pediatrics is an integrated approach to early and differential diagnosis of intrauterine pneumonia in this contingent of patients.
Literature:

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THE ROLE OF THE CONSTITUTION IN THE FORMATION OF A HARMONIOUS PERSONALITY OF A MEDICAL STUDENT

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Abstract

Why does a person need to know their body type? What does it affect? It turns out, almost everything. Physique is genetically determined and cannot be altered through exercise or diet. It is this that "tells" our body how to work: in what places to accumulate fat, how to quickly gain weight and lose it. It is the features of our constitution that influence the choice of style and cuts of clothing, and even leave an imprint on the character and perception of ourselves and the world around us!

Key words: constitution, physique, somatotype, nutrition, training

“Everything should be fine in a person: and face, and clothes, and soul, and thoughts.”

(Anton Pavlovich Chekhov)

Introduction. To date, the most successful and complete definition of the constitution is the following. The constitution (Latin constitutia - establishment, organization) is a complex of individual relatively stable morphological, physiological and mental properties of an organism, caused by heredity, as well as by long-term and intense environmental influences, manifested in its reactions to various influences (including social and pathogenic).

The disadvantage of all these classifications is the lack of an integrated approach. In addition, the concept of "constitution" is often generalized with the concept of "somatotype". In modern studies, the constitutional structure of the physique is considered as a combination of humoral-endocrine and metabolic characteristics with a more accurate complex determination of the parameters of the morphological and functional components of the human body. Somatotype, in anthropology, is the type of human constitution. When isolating the somatotype, the degree of development of the skeleton, muscles and fat deposition, the shape of the chest, abdomen and back are taken into account. However, the physique of a person changes throughout his life, while the somatotype is genetically determined and is his constant characteristic from birth to death.