CLINICAL ASPECTS OF PNEUMONIA IN NEWBORNS

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Abstract. *Examination of the obstetric and gynecological background of the mothers of the children under study revealed that a significant number of them experienced acute respiratory infections (42.3%) and were carriers of TORCH infection during pregnancy and delivery. In addition, they had a complicated pregnancy course: with gestosis in 42.3%, fetoplacental insufficiency in 38.4%, in 55.7% of cases, pregnancy proceeded against the background of anemia, and 36.4% had polyhydramnios. In 25% of cases, childbirth was delivered by caesarean section, with 46.1% due to placental abruption, 30.7% due to a large fetus, and 23% due to breech presentation.*

Clinical manifestations of pneumonia in newborns were characterized by a complex of nonspecific as well as specific symptoms and syndromes of damage to the respiratory system.

Keywords: *clinic, etiology, features, pneumonia, newborn, encephalopathy, ball*

Actuality. Pneumonia in newborns is one of the severe pathologies causing increased neonatal morbidity and death. During the newborn period, pneumonia develops much more often than in other age periods. The beginning of independent breathing is one of the most important factors in a child's adaptation to external existence; intrauterine infection and the development of the inflammatory process are one of the main causes of high-frequency disorders of adaptation of the respiratory system [3,5,7,9,17].

The causative agents of congenital pneumonia are both viruses and bacteria, depending on the route and time of infection. Congenital pneumonia of bacterial origin is more common due to pathogens of TORCH infections [16,18]. Congenital pneumonia of bacterial etiology is more common due to intrapartum infection of the fetus [17,18,19]. When studying the causes of congenital pneumonia, it has been found that both various types of bacteria and respiratory viruses play a role. The severity and outcome of congenital pneumonia are influenced by microbial factors [1,3,6,7,17,23]. In cases of congenital pneumonia with a positive outcome, bacteria such as S. haemolyticus, S. Epidermidis, Enterococcus, and Klebsiella spp. are identified as the causative agents. Diagnostic criteria for congenital pneumonia include focal infiltration on chest X-ray images, matching microflora in mother and child, and pneumonia developing within the first 72 hours of life. Additional criteria for diagnosis involve changes in clinical test parameters and the overall clinical presentation. [3,4,7,8,13, 14, 17,23,25].

Pneumonia in newborns is a significant concern for general practitioners, especially in children under 1 month old. Early diagnosis, particularly in outpatient settings, can be challenging. Viral pneumonia, characterized by a prolonged course, presents diagnostic challenges and accounts for 12-40% of all pneumonia cases. [17,18,19,23,25]. They make up from 12 to 40% of all pneumonia. The prolonged course of pneumonia due to the use of antibacterial agents remains a problem in modern pulmonology. The clinical course of pneumonia in newborns is not always predictable and is accompanied by both pulmonary and extrapulmonary complications. For this reason and due to the widespread distribution of drug-resistant strains of pathogens, antimicrobial

and supportive therapy for pneumonia is unsuccessful in 50% of cases in the early and 20% of cases in the late neonatal period [3,7,8,10,17].

Materials and methods. The study conducted at City Clinical Hospital No. 1 in Tashkent involved 52 newborns, divided into two groups based on clinical presentation and neurological status.

Depending on the course, clinical picture and damage to the central nervous system, the duration and nature of the hypoxia suffered, newborns are divided into 2 groups. Group 1, congenital pneumonia, 26 newborns were admitted to the clinic from maternity hospitals and group 2, community-acquired pneumonia, 26 newborns were admitted from home. When examining newborns, their somatic and neurological status was assessed daily throughout the entire period of hospital treatment. For an objective quantitative assessment of the dynamics of the neurological status of newborns, the “Score assessment of the severity of perinatal encephalopathy” developed at the Research Institute of Pediatrics of the Russian Academy of Medical Sciences by A.A. Stepanov was used [23]. It is based on an integrated assessment of the motor activity of innate reflexes and behavioral reactions of newborns, taking into account the quantitative characteristics of each newborn. The coefficient k was calculated individually upon admission, after 5-8 days of treatment and before discharge (satisfactory condition: $k<0.5$; moderate severity: $0.6<k<1.0$; severe: $k>1.0$).

Clinical blood tests, biochemical and radiological studies, as well as measurements of C-reactive protein concentrations, were conducted."

Results. Examination of the obstetric and gynecological background of the mothers of the children under study revealed that a significant number of them experienced acute respiratory infections (42.3%) and were carriers of TORCH infection during pregnancy and delivery. In addition, they had a complicated pregnancy course: with gestosis in 42.3%, fetoplacental insufficiency in 38.4%, in 55.7% of cases, pregnancy proceeded against the background of anemia, and 36.4% had polyhydramnios. In 25% of cases, childbirth was delivered by caesarean section, with 46.1% due to placental abruption, 30.7% due to a large fetus, and 23% due to breech presentation.

The clinical manifestations of pneumonia in newborns are characterized by a complex of nonspecific as well as specific symptoms and syndromes of damage to the respiratory system. These changes consist of manifestations of intoxication, respiratory failure, dysmetabolic disorders, and microcirculation disorders. When analyzing the clinical picture of newborns transferred from maternity hospitals with a diagnosis of congenital pneumonia, the most common accompanying symptom is intense jaundice (50%), which on the Cramer scale reaches zone 4-5, corresponding to a severe degree of hyperbilirubinemia.

Most newborns had signs of perinatal damage to the central nervous system (CNS). Birth trauma was detected in 27% of children, hypoxic damage to the central nervous system in 42.3% in the form of signs of cerebral ischemia, and in 30.7% in the form of convulsive syndrome.

In newborns of the 1st group of congenital pneumonia, signs of central nervous system depression were detected from birth, which, as ventriculomegaly developed, gradually transformed into symptoms of hypertension. In newborns of this group, CNS depression syndrome occurred in the first day of life (46.1%).

The clinic was manifested by a state of general depression, unstable convergent or divergent strabismus, medium and large-scale horizontal and vertical nystagmus, muscle

hypotonia, hyporeflexia, inhibition of all reflexes. Upon examination, attention is drawn to an increase in flexor muscle tone, a sharp weakening, pain in children, a monotonous cry, pronounced marbling of the skin, diffuse cyanosis at rest, a weak or absent sucking reflex, regurgitation in a fountain, vomiting, persistence of oculomotor and autonomic disorders.

These newborns were characterized by frequent large-scale tremors of the limbs, lability of pulse and breathing. Their condition upon admission to the intensive care unit (ICU) was assessed as very severe k>1. When analyzing the clinical picture of those studied in group 2, it was revealed that newborns were admitted from pediatric departments in the vast majority of cases in a moderate or severe condition. Neonatal pneumonia in 27% of cases had an acute onset, clinically manifested by a wet cough and hard breathing (54%), symptoms of intoxication (73%). The presence of febrile fever in the first days of the disease was noted in 19.2% of cases, and in 80.8% of cases the disease proceeded without an increase in body temperature. Tachypnea and breathing with the participation of the accessory muscles of the chest were detected in 73% of newborns who fell ill at home. In 61.5% of cases, cyanosis of the skin and cyanosis of the nasolabial triangle were pronounced. 46.1% of children had concomitant infectious pathology in the form of catarrhal omphalitis, acute respiratory viral infection, conjunctivitis, catarrhal otitis media, and neonatal jaundice. During the observation of children of the 2nd group, it was revealed that neonatal pneumonia caused more neuro-reflex excitability (77%) and 7.6% convulsive syndrome. At the same time, in newborns the clinic was manifested by general anxiety, spontaneous large-scale nystagmus, increased muscle tone of the flexors, high knee reflexes, increased proboscis reflex, Babinsky and Moro reflexes. Against this background, there was a decrease in protective, searching and sucking reflexes, as well as support reflexes, automatic walking and crawling. The condition of these children upon admission to the neonatal pathology department was assessed as k<1.0.

Clinical condition of neonatal pneumonia in newborns (M± m)

Table No. 1

Indicators	**Group 1 (n=26)**	**Group 2 (n=26)**	
Сутки жизни			P
Restoration of unconditioned reflexes	16±1,3	10,3±0,5	<0,001
Persistence of cyanosis	15,3±1,3	10±0,6	<0,001
Recovery sucking	12±1,3	5,8±0,2	<0,001
Termination of regurgitation	9,2±1,0	6,3±0,4	<0,001
Persistence of tachycardia	9,2±3,6	6,5±0,5	<0,001
Persistence of bradycardia	10,6±1,3	5,2±0,4	<0,001
Restoration of thermoregulation disorders	8,9±1,1	5,6±0,4	<0,001
Bed days	16±0,8	10,3±0,5	<0,001

Thus, prolonged intrauterine hypoxia caused lung damage, reduced the drainage functions of the airways, led to deficiency and insufficient activity of pulmonary macrophages, and was a favorable background for the development of pneumonia.

In the diagnosis of pneumonia in newborns, X-ray and laboratory examinations were of great importance. Changes in blood parameters reflected not only the infectious process (leukocytosis, neutrophilia with a shift to the left, increased neutrophil index -90.3% of cases), but also reflected immunosuppression in some newborns (lymphopenia, neutropenia), and also from the first days of the disease in some children, the following changes were noted: anemia (80.7%), thrombocytopenia (50%) and an increase in C reactive protein (73%). An increase in C-reactive protein levels greater than 6 mg/L is an early sign of bacterial infection in full-term infants [2,4]. X-ray studies more often revealed bilateral focal pneumonia (34.6%), segmental (30.7%), lobar (11.5%) and right-sided focal (15.3%). Less common are left-sided focal pneumonia (7.6%). Bilateral small-focal inflammatory infiltrates were significantly more often ($p < 0.05$) detected in moderate pneumonia, and segmental infiltrates were detected in severe pneumonia ($p < 0.05$).

Thus, extensive inflammatory changes in the lung tissue in newborns were observed in group 1. In group 2 of early neonatal pneumonia, bilateral (65.4%) or right-sided pneumonia (34.6%) prevailed. As is known, this happened due to the fact that the child's body is not able to restrain the inflammatory process within the boundaries of one segment. In addition, a constant horizontal position and wide bronchi with thin alveolar septa only contribute to the rapid spread of infection to new areas. There were differences in the X-ray picture between these two types of pneumonia. Extensive inflammatory changes in the lungs - segmental and bilateral focal 30.7% and 34.6%, respectively ($p <0.001$) are typical for intrauterine pneumonia, and for early neonatal ones - bilateral in 65.4% and right-sided - 34.6% ($p <0.001$). Assessment of the main radiological sign - focal shadows, as we established in the 1st group of newborns, the specificity was 96%, sensitivity 26.4%. In the 2nd group of newborns there was a similar picture - the specificity of this sign was also high and amounted to 98%, but the sensitivity was only 16.5%. This indicates, first of all, that this sign cannot be the main criterion for the diagnosis of intrauterine and early neonatal pneumonia, since its sensitivity is low, with very high specificity [17,22,24, 25]. This radiological sign has greater diagnostic value, as it reflects the stage of the inflammatory process - edema and hyperemia [25].

Conclusions: Thus, prolonged intrauterine hypoxia causes lung damage, reduces the drainage functions of the airways, leads to deficiency and insufficient activity of pulmonary macrophages, and this is a favorable background for the development of pneumonia. Predisposing factors, such as the frequency of acute respiratory diseases, carriage of TORCH infection, complicated pregnancy: in the form of gestosis, threat of miscarriage, chronic hypoxia, fetoplacental insufficiency, anemia and pathological childbirth are also a favorable background for the development of pneumonia.

The data obtained indicate that the duration of hypoxia, the state of health, the course of pregnancy and childbirth in the mother determine the severity of pneumonia and affect the severity of clinical, etiological and neurological symptoms in newborns.

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