

SPECIFICITY OF THE COURSE AND COMPLICATIONS OF PNEUMONIA IN CHILDREN WITH CEREBRAL PALSY

ОСОБЕННОСТИ ТЕЧЕНИЯ И ОСЛОЖНЕНИЯ ПНЕВМОНИИ У ДЕТЕЙ С ЦЕРЕБРАЛЬНЫМ ПАРАЛИЧЕМ

SEREBRAL FALAJI BO'LGAN BOLALARDA PNEVMONIYANING KECHISHI VA ASORATLARINI O'ZIGA XOSLIGI

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Abstract: *This article analyzes the clinical course, diagnosis, and specific aspects of pneumonia in patients with cerebral palsy (CP). The study found that pneumonia is a high-risk factor in children with CP, and its course is more severe due to respiratory weakness, impaired swallowing reflexes, and decreased overall immunity. The article also highlights the frequent recurrence of pneumonia, its chronicity, and the possibility of developing complications, such as bronchiectasis, pulmonary fibrosis, and cardiovascular changes. Recommendations are made for early detection, appropriate treatment, and development of preventive measures for these conditions.*

Keywords: *CP, pneumonia, complications, clinical course, immunity, respiratory failure, bronchiectasis, rehabilitation*

Аннотация: *В статье проанализированы особенности клинического течения, диагностики и особенности пневмонии у больных детским церебральным параличом (ДЦП). В ходе исследования установлено, что пневмония является фактором высокого риска у детей с ДЦП, а ее течение более тяжелое за счет дыхательной слабости, нарушения глотательных рефлексов и снижения общего иммунитета. В статье также подчеркивается частая рецидивирующая пневмония, ее хронизация и возможность развития осложнений, таких как бронхоэктатическая болезнь, легочный фиброз и сердечно-сосудистые изменения. Даны рекомендации по раннему выявлению, адекватному лечению и разработке профилактических мероприятий при этих состояниях.*

Ключевые слова: *ДЦП, пневмония, осложнения, клиническое течение, иммунитет, дыхательная недостаточность, бронхоэктатическая болезнь, реабилитация*

Annotatsiya: *Ushbu maqolada serebral falaji (BSF) bo'lgan bemorlarda pnevmoniyaning klinik kechishi, tashxisi va o'ziga xos jihatlari tahlil qilinadi. Tadqiqot shuni ko'rsatdiki, BSF bilan og'rigan bolalarda pnevmoniya yuqori xavf omili bo'lib, uning kursi nafas olishning zaifligi, yutish reflekslarining buzilishi va umumiy immunitetning pasayishi tufayli yanada og'irroq bo'ladi. Maqolada, shuningdek, pnevmoniyaning tez-tez takrorlanishi, uning surunkaliligi, bronxoektaziya, o'pka fibrozi va yurak-qon tomir tizimidagi o'zgarishlar kabi asoratlarni rivojlanish ehtimoli ko'rsatilgan. Ushbu holatlarni erta aniqlash, tegishli davolash va profilaktika choralarini ishlab chiqish bo'yicha tavsiyalar beriladi.*

Kalit so'zlar: *BMF, pnevmoniya, asoratlar, klinik kechish, иммунитет, nafas olish etishmovchiligi, bronxoektaziya, rehabilitatsiya*

Introduction. Cerebral palsy (CP) is one of the most common neurological disorders of childhood, characterized by permanent changes in movement and muscle tone, mainly as a result of disorders in brain development. This condition negatively affects not only movement, but also vital functions such as breathing, swallowing, and immune system activity. Children living with CP have a particularly high incidence of pneumonia (lung inflammation), and the course, clinical signs, and complications of this infection can differ significantly from those in healthy children.

Factors contributing to this discrepancy include muscle hypotonia or hypertonia, impaired swallowing reflexes, immobilization, and immunosuppression. In addition, pneumonia in children with CP is often aspiration-related, which further increases the risk of infection and can lead to severe complications, including prolonged illness, chronic respiratory failure, and even death.

This article analyzes the causes, clinical course, diagnosis, and complications of pneumonia in children with cerebral palsy. It also emphasizes the importance of developing effective treatment and preventive measures for this group of children.

Materials and methods of the study. The medical records of 60 children aged 1 to 10 years, diagnosed with cerebral palsy and suffering from pneumonia, treated in the pediatric department during 2023–2024, were analyzed as research materials. Patients were divided into groups according to the following criteria:

Group 1: 30 patients with cerebral palsy and diagnosed with pneumonia.

Group 2 (control group): 30 children without neurological pathology, but diagnosed with pneumonia.

Research methods: Clinical examination: body temperature, respiratory rate, general condition were assessed. Laboratory tests: complete blood count, C-reactive protein, leukocyte count.

Instrumental examinations: Chest X-ray.

Lung auscultation and percussion.

Computed tomography (CT) if necessary.

Neurological assessment: type of cerebral palsy (spastic, ataxic, mixed) and degree of movement limitations (according to the GMFCS scale).

Statistical analysis: the collected data were analyzed using the SPSS program based on mean values and confidence intervals.

The main objective of the study was to determine the severity and course of pneumonia in children with BSF and complications by comparing them with healthy peers.

Results of the study: During the study, the clinical course of pneumonia, duration of treatment, laboratory and instrumental indicators were compared between patients in group 1 (BSF and pneumonia) and group 2 (pneumonia, but no BSF).

Severity of clinical symptoms: The respiratory rate in group 1 patients was on average 45 ± 5 times per minute, which was higher than the indicator of 35 ± 4 times in group 2 ($p < 0.01$).

Body temperature was high, and in most cases in group 1 it was above 39°C (63%), and in group 2 – in 40%.

Swallowing reflex and risk of aspiration: 70% of patients in group 1 had swallowing disorders and signs of aspiration, which led to chronic and recurrent pneumonia.

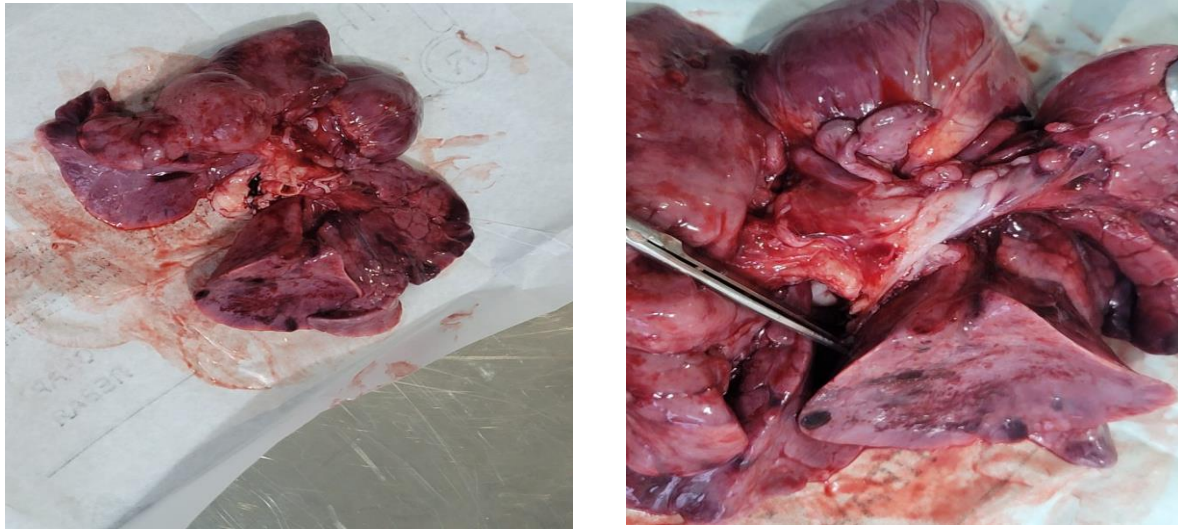
Laboratory tests: The average leukocyte count in group 1 was $15,800 \times 10^9/l$, which was significantly higher than in group 2 ($p < 0.05$). The level of C-reactive protein was also higher (group 1: 75 ± 10 mg/l; group 2: 45 ± 8 mg/l).

Instrumental examination results: As a result of radiographic tests, bilateral pneumonia (43%) and lower segment lesions (58%) were detected in most cases in group 1 patients. In group 2, unilateral mild forms predominated (67%).

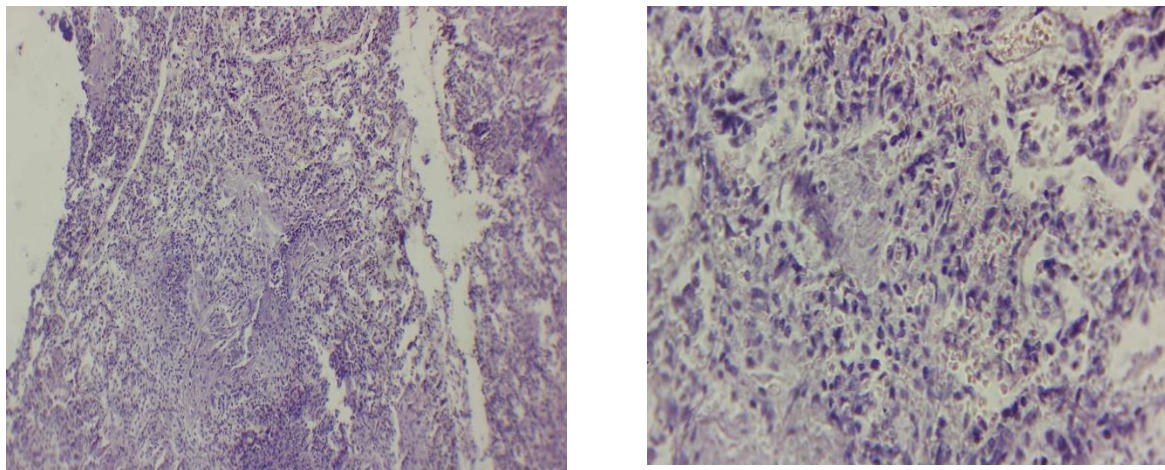
Duration of treatment and complications: The average duration of treatment in group 1 patients was 14 ± 3 days, while in group 2 this indicator was 9 ± 2 days ($p < 0.01$).

The following complications were more common in patients with BSF: Bronchial obstruction – 30%; Chronic bronchitis – 25%; Signs of pulmonary fibrosis – 10%; Cardiac arrhythmias – 8%.

For the micro study, autopsy sections from the lungs of children with DSP who died of pneumonia were fixed in formaldehyde solution (prepared in 10% phosphate buffer) for 72 hours and examined by staining with hematoxylin and eosin.



Picture 1. Lungs: Macroscopically enlarged, smooth on the outside, inflated anteriorly. Most of the sections of both lungs are dark brown with a mottled appearance, and the tissue is swollen. On cross-section, the bronchi are dilated, focal hemorrhages and inflammatory infiltrates are detected in the surrounding tissue, and the paratracheal lymph nodes are enlarged.



Picture - 2. Lungs: Microscopically: dilation of some alveoli , disruption of many of the remaining alveolar barriers , some alveoli around the bronchi filled with exudate consisting of macrophages , leukocytes and alveolar epithelium, uneven perfusion of all blood vessels , diffuse perivascular and diapedetic hemorrhages ; Stain: hematoxylin-eosin. Cat.: a) 10x10; b) 10x40

Conclusion. The results of the study showed that pneumonia in children with cerebral palsy (CP) is more severe and more prone to complications. The main reasons for this were insufficient activity of the respiratory muscles, impaired swallowing reflex, and a high risk of aspiration. In addition, low immunity and mobility limitations in children with CP create problems in the early detection and full treatment of pneumonia.

During the study, it was noted that children with CP had a higher incidence of bilateral and lower-segment pneumonia, high levels of inflammatory markers (leukocytes, CRB), and a significantly longer treatment period. The recurrence of pneumonia, the development of complications such as bronchial obstruction, chronic bronchitis, and pulmonary fibrosis emphasize the need for constant

monitoring and an individual approach for patients in this group. Pneumonia is more severe and requires longer treatment in children with cerebral palsy.

Swallowing reflex disorders and the risk of aspiration are among the main causes of pneumonia in these patients.

Complications (bronchial obstruction, chronic bronchitis, pulmonary fibrosis) are more common in children with cerebral palsy than in their healthy peers.

A comprehensive approach is needed to prevent pneumonia, focusing on rehabilitation, physiotherapy, nutrition, and strengthening immunity.

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