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INDICES OF THE INFLAMMATORY PROCESS LEVEL IN BRONCHI OF CHILDREN WITH VARYING SEVERITY OF BRONCHITIS

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The evaluation of the biomarkers of inflammatory activity in the exhaled air condensate to improve the diagnosis of the course severity of bronchitis in children.

One hundred-fifty-eight children with bronchitis were examined in the Pulmoallergy Department of the Regional Children's Clinical Hospital in Chernivtsi city. The average age of the examined children was 6.6 ± 0.30 years. Of the children surveyed, 63.3% were boys and 36.7% were girls, with the majority of patients living in rural areas (60.1%). A total of 11 patients diagnosed with acute simple bronchitis, 22 children suffered from recurrent simple bronchitis, 44 patients - with acute obstructive bronchitis, and 81 children presented with the recurrent obstructive type of the disease were comprehensively examined. In children with bronchitis in 34.8% of cases there was an acute course of the disease, and in 65.2%, respectively, recurrent type. In 21.6% of patients the non-obstructive nature of bronchial tree inflammation was verified, in 78.4% - obstructive, and in 5.7% of cases there were signs of purulent endobronchitis.

The severity of bronchitis was assessed at the onset of the disease and on days 3 and 7 of inpatient treatment using the Bronchitis Severity Score (BSS), which consists of five domains of the questionnaire: cough, sputum production (expectoration), wheezing (auscultation), pain in the chest during coughing and shortness of breath (dyspnoea). Each component of BSS was assessed by the researcher using a 5-point verbal Lockert rating scale from 0 to 4 points (0: absent; 1: mild; 2: moderate; 3: severe; 4: very severe), and the overall score of BSS was the sum of 5 ratings with a maximum of 20 points (1-2 - Acute bronchitis is unlikely; 3-7 points - Mild acute bronchitis; 8-12 points - Moderate acute bronchitis; 13-17 - Severe acute bronchitis; 18-20: Very severe acute bronchitis). Thus, according to this scale, 30 patients were tested for mild bronchitis, which formed the I clinical group, and 128 children - moderate bronchitis (II clinical comparison group). The average age of the representatives of the first clinical group was 7.4 ± 0.84 years, the second group - 6.4 ± 0.31 years ($p > 0.05$). The gender composition of the groups was almost the same (70.0% of boys in group I against 62.0% in group II). At the same time, group I included 53.0% of patients, and group II included 85.0% of children with obstructive bronchitis ($p < 0.05$).

The content of ceruloplasmin in the exhaled air condensate was 133.9 mg/l in patients of clinical group I and 192.1 mg/l in children of group II, respectively ($p > 0.05$), which indicates a more pronounced inflammation in bronchi in children with greater severity of bronchitis according to the BSS scale and the accumulation of this protein in the exhaled air condensate. A similar tendency to the higher activity of the inflammatory process in children of group II compared to patients of clinical group I was observed in the content of the "golden marker of inflammation" - metabolites of nitrogen monoxide (38.7 ± 2.84 mmol / l vs. 54.2 ± 5.39 mmol / l, respectively, $p < 0.05$). Thus, the ratio of the chances of detecting an active inflammatory process by the content of metabolites of nitrogen monoxide more than 40 mmol / l in patients of clinical group II relative to patients of group I was 1.8 (95% CI: 0.49-6.20), the relative risk was of 1.54, a plausibility ratio - of 1.3 with an accuracy of 41.8% and an area above the AUC ROC curve - 0.38

Based on the received data we may conclude, that in children suffering from bronchitis, with a more severe course of the disease, determined according to the BSS scale (Bronchitis severity score), there is an accumulation of inflammatory biomarkers such as metabolites of nitrogen monoxide and ceruloplasmin in the condensate of exhaled air, which confirms the higher activity of the inflammatory process in patients with the moderate course of bronchitis compared to patients with mild bronchitis.