CLINICAL COURSE OF THE CARDIOVASCULAR SYSTEM WITH BRONCHIAL OBSTRUCTION IN PRESCHOOL CHILDREN

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Abstract. *To achieve this goal, a comprehensive examination of 50 patients aged 3 to 7 years with acute obstructive bronchitis was carried out. Electrophysiological changes in the cardiovascular system revealed in children with acute obstructive bronchitis, manifested in the form of disturbances in repolarization processes in the myocardium, rhythm and conduction disturbances, suggest a cause-and-effect relationship with hypoxia in bronchial obstruction.*

Keywords: *Acute broncho-obstructive syndrome, children, preschool age, cardiovascular system, ECG.*

Relevance: Acute broncho-obstructive syndrome of viral or viral-bacterial etiology has the highest frequency in childhood. According to Tatochenko V.K. (2000), in every fourth child with acute respiratory disease, the bronchi with prolonged broncho-obstructive syndrome are involved in the inflammatory process. Respiratory disorders in acute obstructive syndrome of infectious origin have varying degrees of severity and are accompanied by hypotension and metabolic acidosis[9]. In the works of both domestic and foreign researchers, it was shown that it is the combination of viral infection, autonomic disorders and acute hypoxia that occurs with bronchial obstruction in young children that underlies multiple organ lesions, including the cardiovascular system[9]. A number of studies have proven the cardiotropic nature of influenza viruses and enteroviruses[4], which contribute to the development of acute infectious myocardial damage in children. Recently, chlamydial and mycoplasma infections have been assigned a significant role in the development of acute infectious lesions of the cardiovascular system[6]. At the same time, the nature and severity of changes in the cardiovascular system and their prognostic significance in acute respiratory diseases accompanied by bronchial obstruction in young children have not been sufficiently studied. The use of modern highly informative instrumental and biochemical research methods has made it possible to identify markers of inflammatory cardiomyopathy in children [1,6]. The results of a biopsy of the heart muscle of patients with myocarditis confirm the presence of dystrophic and fibrotic changes in the myocardium. At the same time, there is no clear data in the literature on the frequency and nature of infectious myocardial damage in children. Against the backdrop of a continuous increase in the number of children with cardiovascular pathology[7], the significance of infectious lesions in young children in the development of such common diseases as heart rhythm and conduction disorders has not been studied. At the same time, it has been shown that late diagnosis of diseases of the cardiovascular system and inadequate assessment of their prognosis in children underlie the formation of both chronic forms of pathology and high morbidity and mortality in older age groups [7,8].

Thus, the state of the cardiovascular system in preschool children with bronchial obstruction has been practically not studied, risk factors for the formation of pathological changes and their prognostic significance have not been determined, methods for the prevention of chronic

forms of cardiovascular pathology have not been developed, which determined the purpose of this study.

Purpose of the study: to study the features of the state of the cardiovascular system with bronchial obstruction in preschool children.

Materials and methods of research. To achieve this goal, a comprehensive examination of 50 patients aged 3 to 7 years with acute obstructive bronchitis who were treated in the pulmonology department of the Republican Specialized Scientific and Practical Medical Center for Pediatrics of the Ministry of Health of the Republic of Uzbekistan was carried out. All patients upon admission to the department underwent a comprehensive examination, which included a clinical analysis of blood and urine, biochemical and x-ray examinations of the chest organs. Analysis of the child's development in subsequent years included: identification of the frequency of colds (according to the age period with calculation of the infectious index), the presence of concomitant diseases and chronic foci of infection, visits to preschool educational institutions and other questions.

Statistical processing of the obtained results was carried out using application programs for statistical data processing Statistica® version 6.0. The significance of differences between the compared groups was assessed using Student's tests. Differences in the compared values were considered statistically significant at $p<0.05$.

Results and discussions. The group of patients with acute obstructive bronchitis (AOB) was divided into two subgroups: 1 subgroup (main) - children in whom AOB occurred with disturbances in the adaptation of the cardiovascular system (CVS); Group 2 (comparison) - children who did not have any disturbances in the functioning of the cardiovascular system.

We carried out a detailed analysis of the frequency of concomitant pathologies in children with AOB (Fig. 1), which showed that among concomitant diseases in preschool children, AOB in 1 subgroup were significantly more often detected: anemia of varying degrees (66%), perinatal damage to the central nervous system (42 %), atopic dermatitis (24%) and residual effects of rickets (16%), in subgroup 2 - anemia of varying degrees (68%), perinatal damage to the central nervous system - in 34% of children, atopic dermatitis (24%) and residual effects of rickets - (12%).

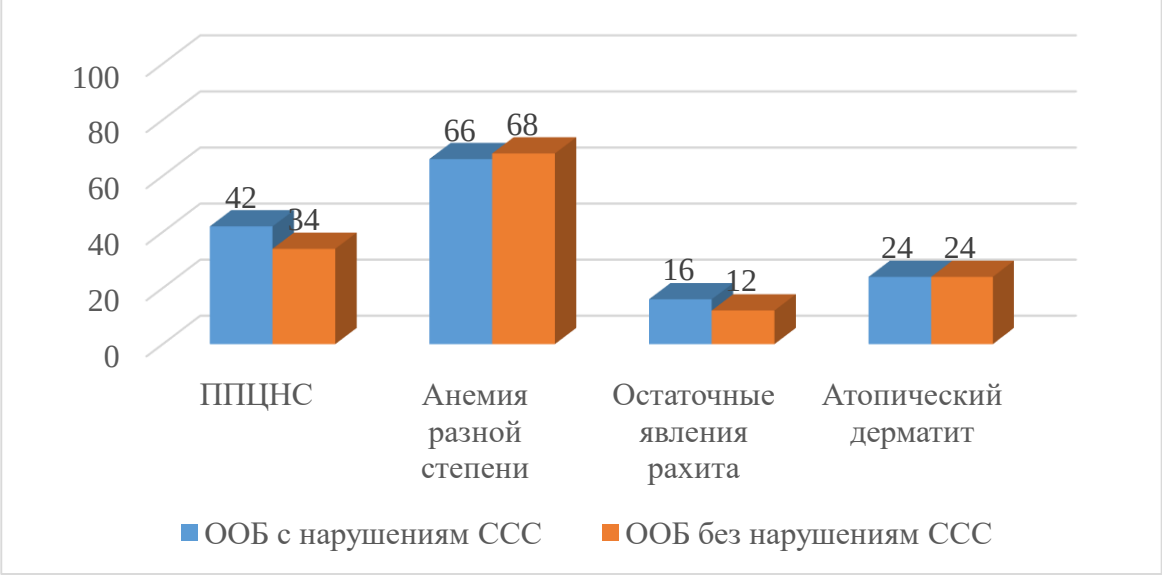

Fig.1. Concomitant pathology in children with AOB

The frequency of complications during pregnancy occurred 2 times more often in mothers whose children had AOB, occurring with a functional impairment of the cardiovascular system (p <0.005). In 76% of mothers, pregnancy proceeded with anemia. The problem of anemia in pregnant women is relevant due to the significant impact of this pathology on the course of pregnancy and the health of the newborn. Anemia in a pregnant woman is a predisposing factor to the development of impaired functioning of the immune system in the child. We found that at the time of pregnancy and childbirth, 47% of mothers had chronic diseases (p <0.05) (chronic tonsillitis, chronic pyelonephritis), which can aggravate both the antenatal and postnatal periods of the child's development. The studies showed that frequent complaints in children of both groups were: cough (100%), expiratory shortness of breath in 1 subgroup 97% and in 2 subgroup 94%, fever in children of both groups 65%; runny nose in 1 subgroup 18.3% , in subgroup 2 16.5% (Figure No. 2).

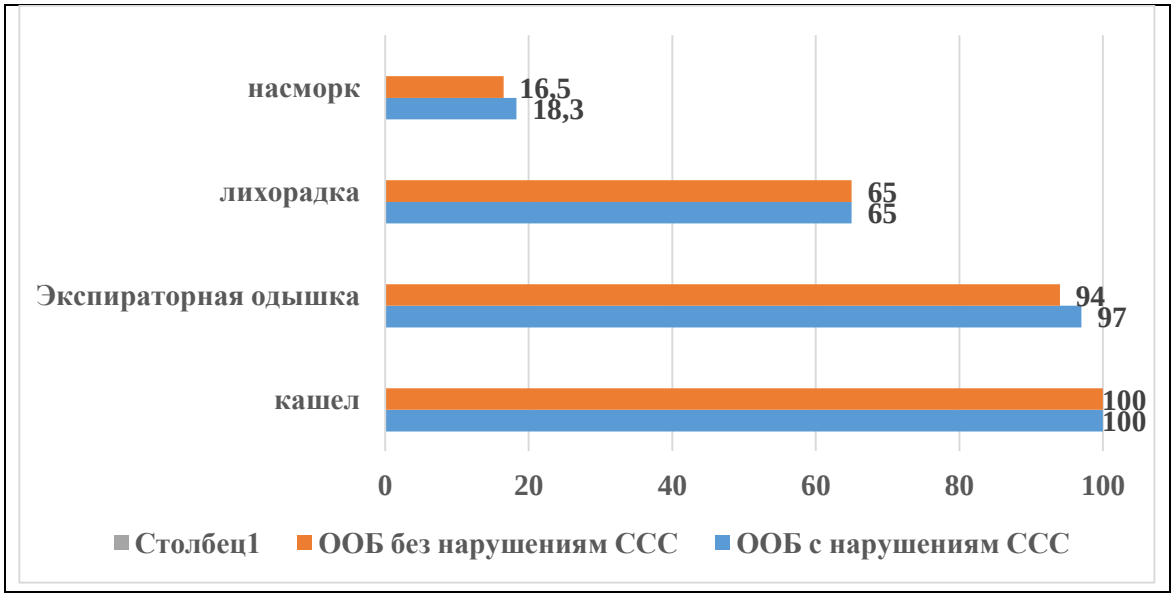

Fig.2. The most common complaints in children with acute obstructive bronchitis.

To assess the severity of bronchial obstruction, W. Tal (1996) scoring tables were used, which assessed the degree of respiratory failure. According to the W.Tal scoring tables, mild obstruction corresponds to 2-4 points, moderate severity - 5-8 points, severe - 9-12 points. Our studies revealed that in children in subgroup 1, in 32% of cases, obstruction was of moderate severity, mild in 68%, and in subgroup 2, obstruction of moderate severity was 19%, mild in 81%. Observation of moderate severity of obstruction in children of group 1 also caused functional changes in the cardiac vascular system. Thus, according to biochemical studies in children, the recalcification time was increased, on average it was 25%, and the inflammatory mediator CPK in both groups corresponded to the reference values (indicators), i.e. standards This indicates that children with AOB experience only functional changes in the cardiovascular system.

Analysis of ECG data indicates disturbances in heart rhythm and conduction in the form of sinus tachycardia (29.0%) and bradycardia (8.3%), sinus arrhythmia (17.6%), incomplete blockade of the right bundle branch (25.3%) , as well as metabolic changes in the myocardium in the form of early ventricular repolarization syndrome (67.3%). When analyzing the heart rate, two degrees of its increase were identified: moderate tachycardia - an increase in the rhythm by 20-30% and severe tachycardia - by 50% compared to standard values. According to a chest x-ray, 12.5% of children have a cardiothoracic index greater than 0.5 (CTI > 0.5), which indicates a disorder of the cardiovascular system.

Conclusions. Thus, the electrophysiological changes identified in children with AOB, which manifested themselves in the form of disturbances in repolarization processes in the myocardium, rhythm and conduction disturbances, were found in children with AOB and this suggests a cause-and-effect relationship with hypoxia in bronchial obstruction, as well as in the early stages to identify children at risk for the development of adaptation disorders of the cardiovascular system in AOB.

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