

CLINICAL MANIFESTATIONS OF ACUTE MYOCARDITIS IN CHILDREN ON THE BACKGROUND OF BRONCHO-PULMONARY DISEASES

Khasanova Gulnoza Rustamovna,

resident doctor pediatric intensive care unit of the Samarkand Branch of the Republican
Scientific Center for Emergency Medicine.
Samarkand, Uzbekistan

Kardjavova Gulnoza Abilkasimovna

Scientific supervisor:
PhD, assistant of the Department of 1 Pediatrics and Neonatology
Samarkand State Medical University,
Samarkand, Uzbekistan.

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Abstract. *Broncho-pulmonary diseases in children is one of the urgent problems in pediatrics, which is determined by the continuing high incidence and severe prognosis, especially in young children. The aim of the study was to determine the clinical characteristics of acute myocarditis in children with acute broncho-pulmonary diseases. We examined 84 children aged 6 months to 6 years with broncho-pulmonary diseases, which we divided into 2 groups. Group I (control) included 42 children who had only respiratory complaints. Group II (main) included 42 sick children with broncho-pulmonary diseases, who had a violation of the cardiovascular system, the presence of which was confirmed by instrumental methods. The results obtained emphasize that against the background of broncho-pulmonary diseases, all symptoms of acute heart failure are masked, the cause of which in most cases is acute coronary insufficiency; changes in the heart muscle in this pathology in children increases the risk of severe unwanted heart complications.*

Key words: *acute myocarditis, broncho-pulmonary diseases, children.*

КЛИНИЧЕСКИЕ ПРОЯВЛЕНИЯ ОСТРОГО МИОКАРДИТА У ДЕТЕЙ НА ФОНЕ БРОНХОЛЕГОЧНЫХ ЗАБОЛЕВАНИЙ

Аннотация. *Бронхо-легочные заболевания у детей являются одной из актуальных проблем педиатрии, что определяется сохраняющейся высокой заболеваемостью и тяжелым прогнозом, особенно у детей раннего возраста.*

Цель исследования - определить клинические особенности острого миокардита у детей с острыми бронхолегочными заболеваниями. Обследовано 84 ребенка в возрасте от 6 мес до 6 лет с бронхолегочными заболеваниями, которых мы разделили на 2 группы. В I группу (контрольную) вошли 42 ребенка, у которых были жалобы только на органы дыхания. Во II группу (основную) вошли 42 больных ребенка с бронхолегочными заболеваниями, у которых имелись нарушения сердечно-сосудистой системы, наличие которых было подтверждено инструментальными методами. Полученные результаты подчеркивают, что на фоне бронхолегочных заболеваний маскируются все симптомы острой сердечной недостаточности, причиной которой в большинстве случаев является острая коронарная недостаточность; Изменения сердечной мышцы при этой патологии у детей повышают риск развития тяжелых нежелательных сердечных осложнений.

Ключевые слова: *острый миокардит, бронхолегочные заболевания, дети.*

Relevance. For several decades, severe broncho-pulmonary diseases has remained one of the urgent problems of modern medicine due to the steady trend towards an increase in the number of patients and a consistently high mortality rate, despite the use of new principles and methods of treatment [3,4]. The probable reason for this is the delayed diagnosis and, as a consequence, late initiation of treatment, as well as the impossibility of conducting an adequate assessment of the effectiveness of therapy. The diagnosis of broncho-pulmonary diseases in children is often difficult, especially if signs of respiratory failure have developed against the background of ARVI.

The problem of acute myocarditis is currently due to its widespread occurrence, especially in childhood.

One of the main causes of acute myocarditis today is acute respiratory viral infections (ARVI), which remain the most common and global diseases in children. Cardiovascular failure is common in broncho-pulmonary diseases, especially in young children. It develops rapidly, already in the early stages of the disease. With an uncomplicated course of the disease, clinically latent heart failure occurs, it is diagnosed with the help of instrumental studies such as ECG, Echo CG. With broncho-pulmonary diseases in children, dysfunction of the cardiovascular system can clinically manifest itself in the form of coronary insufficiency, and more often cardiovascular failure. [2,7,9,]. Each flu epidemic accompanied with a complication of broncho-pulmonary diseases in children is associated with an increase in the number of cases of acute myocarditis, which determines the urgency of studying this problem.

An even more serious task is the timely diagnosis of complications of broncho-pulmonary diseases, especially myocarditis, since the identification of this cardiac complication allows you to avoid severe and sometimes fatal consequences for the patient. Previously developed clinical criteria, diagnostic criteria for the diagnosis of heart failure are not always objective enough to identify circulatory disorders in young children. For example, anxiety, decreased appetite, poor sleep in children are almost always noted. Tachypnea and tachycardia can be not only a sign of broncho-pulmonary diseases, but also occur in a healthy child during examination, feeding, etc.

Shortness of breath, tachypnea are always accompanied by diseases of the bronchi and lungs. The frequency of myocarditis in Broncho-pulmonary diseases according to different authors varies from 1 to 15%. From a diagnostic point of view, there are no specific electrocardiographic changes characteristic only for myocarditis.

Myocarditis is an inflammatory lesion of the heart muscle of an infectious, toxic-infectious, infectious-allergic, autoimmune and toxic etiology [6]. This disease is predominantly of children and young people, although the disease can develop at any age. Any viral or bacterial agents, as well as non-infectious factors, can be the cause of myocarditis. The most common cause of the disease is viruses. In 6-8% of cases, myocarditis develops during or shortly after various sporadic or epidemic viral infections [1].

Of the bacterial myocarditis, the most dangerous are diphtheria (infectious toxic), myocarditis with scarlet fever, typhoid fever and salmonellosis, tuberculosis, yersiniosis (intestinal and pseudotuberculosis), with generalized streptococcal and staphylococcal infections, 10 pathogens associated with these [8].

Purpose. To determine the clinical characteristics of acute myocarditis in children with broncho-pulmonary diseases.

Materials and research methods. We examined children aged 6 months to 6 years with broncho-pulmonary diseases, who were hospitalized in the emergency pediatrics and children's intensive care units of the SB of RSCEMA. The average age of the examined children was 2.4 years old. The exclusion criteria were: a previous infectious disease within a month before hospitalization, the presence of organic heart disease (congenital and acquired heart defects, cardiomyopathy), the presence of signs of rheumatic fever and coronary artery disease. A total of 64 patients with broncho-pulmonary diseases who met the exclusion criteria were included in the study.

Evaluation of the effectiveness of the therapy for broncho-pulmonary diseases according to the standard was carried out on the basis of objective signs of cyanosis, congestive wheezing in the lungs and tachycardia. Assessment of the severity of cyanosis in patients was assessed by central and peripheral distribution, and cough by a 4-point system: 0 points - no cough, 1 point - a single cough, 2 points - moderately expressed cough and 3 points - frequent, painful cough.

Tachycardia and cyanosis were the main signs of heart damage in Broncho-pulmonary diseases, which tended to continue even against the background of the disappearance of intoxication from the underlying disease.

Additional criteria for the effectiveness of therapy were the duration of oxygen therapy and the duration of hospitalization. Patient management was carried out in accordance with the specifics of the Emergency Medical Service, diagnostic and treatment standards (the recommended deadlines for inpatient treatment of bronchopulmonary diseases were observed).

Discharge criteria were: satisfactory condition, $SpO_2 \geq 95\%$, reduction in cough, shortness of breath and tachycardia. The presence of changes in the electrocardiographic study of "metabolic nature" according to the conclusion of the cardiologist and insignificant preserved oral cyanosis were not a contraindication for discharge. The observation of the patients continued until the main symptoms of the disease were completely resolved.

Research results and discussion. After the study, the main indicators of patients in the compared groups were analyzed and compared at admission to the hospital. The analysis showed that the patients selected for the main and control groups were comparable in terms of gender, age, target indicators. Upon repeated examination of children with cardiac disorders at discharge, the following hemodynamic parameters remained: LVEF in the treatment group decreased $45.6 \pm 8.7\%$ to $26 \pm 7.3\%$ to in the placebo group, where there was a decrease in EF from $24.6 \pm 6.5\%$ to $19.4 \pm 6.8\%$; of course, the diastolic volume in the treatment group decreased from 25.7 ± 50.1 to 140.7 ± 50.6 vs in the placebo group, where EDV increased from 245 ± 46.3 to 280.6 ± 48.9 .

The most frequent changes recorded on the ECG are sinus tachycardia, which was noted in 33 (39.1%) patients, ST segment changes in 17(14,28%), AV block in 7(8,7%), left bundle branch block in 27(22.68%) patients. Thus, the most valuable electrocardiographic parameter in patients with myocarditis, is a change in the QRS complex.

The results of our study show that it is necessary to conduct echo cardiographic, as well as electrocardiographic studies of children with broncho-pulmonary diseases, causes a decrease in complicated cardiorespiratory syndromes and post hypoxic changes in the ventricular myocardium, which allows us to conclude that there is a certain advantage of preventive examination to prevent the development of chronic cardiovascular pathology. The most frequent

changes recorded on the ECG were sinus tachycardia, which was noted in 18 (39.1%) patients, ST segment changes in 12, AV block in 4 (8.7%), left bundle branch block in 22 (47, 8%) patients.

Studies have shown that at present, that, due to the fact that the number of cardiac pathology at autopsy significantly exceeds its lifetime detection, the problem of early diagnosis of cardiovascular pathology and risk factors for its development in sick children with broncho-pulmonary diseases remains an urgent issue of clinical medicine [4].

According to many authors [1,10], dysfunction of the cardiovascular system is an almost constant companion of broncho-pulmonary diseases and develops from the first hours; at the same time, circulatory disorders often determine the prognosis and outcome of broncho-pulmonary diseases itself. Among the pulmonary and extrapulmonary complications of broncho-pulmonary diseases, an important place is occupied by lesions of the cardiovascular system [2,4].

Conclusion. Thus, an echocardiographic study of children with broncho-pulmonary diseases leads to a decrease in complicated cardiorespiratory syndromes and post-hypocal changes in the ventricular myocardium, which allows us to conclude that there is a certain advantage of preventive examination to prevent the development of chronic cardiovascular pathology under the "mask" of broncho-pulmonary diseases in children and further transformation of the disease into various cardiopathy. The clinical manifestations of heart failure in early childhood are non-specific, which in order to clarify the diagnosis, it is necessary to conduct a complete clinical and instrumental study, including an ECG with the calculation of indicators of central hemodynamics.

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