



STATE OF THE CARDIOVASCULAR SYSTEM IN ACUTE PNEUMONIA IN CHILDREN OF DIFFERENT AGE GROUPS

Khankeldieva H.K.

Valizhonov Sh.S.

Mirzaeva Z.U.

Andijan State Medical Institute

Abstract

Respiratory diseases remain one of the determining causes of childhood morbidity in different regions of Uzbekistan. This article discusses the results of instrumental measurement of cardiovascular system at children with acute pneumonia.

Keywords

Younger children, echocardiography, acute pneumonia, climatic zone.

INTRODUCTION

Changes in the parameters of the functional activity of the circulatory system in acute pneumonia are extremely diverse. In severe forms of acute pneumonia in children, disorders of cardiovascular activity are naturally detected, which largely determine the severity of the patient's condition, the prognosis of the disease and require correction of hemodynamic disorders.

Clinical and instrumental research methods make it possible to identify the leading pathophysiological syndrome, the most characteristic combination of hemodynamic disorders, and clarify the severity of cardiovascular disorders.

MATERIALS AND METHODS

The purpose of this study was to establish the characteristics of hemodynamic disorders in young children with acute pneumonia depending on the regional factor - the altitude of residence above sea level.

The material for this study was the results of an electrocardio- and echocardiographic study of the cardiovascular system in 146 young children with acute pneumonia living in the foothills and highlands.

When studying the data of an electrocardiographic study in 80 children with acute pneumonia in low-altitude conditions and in 66 children with pneumonia in a high-mountain region, a compensatory increase in the load on the cardiovascular system was established, manifested by changes in instrumental parameters (Table 1).

Table 1



Indicators of electrocardiographic examination in acute pneumonia in low and high altitude conditions [2]

ECG indicators	acute period*		Improvement**	
	low mountains	highlands	low mountains	highlands
1. Rhythm indicators:				
Moderate tachycardia (140-175 bpm)	32 (40,0%)	24 (36,4%)	22 (27,5%)	19 (28,8%)
Severe tachycardia (> 175 bpm')	48 (60,0%)	42 (63,6%)	0	0
Isorhythmia	51 (63,8%)	45 (68,2%)	18 (22,5%)	11 (16,7%)
Arrhythmia	29 (36,2%)	21 (31,8%)	4 (5,0%)	8 (12,1%)
Paroxysmal tachycardia	4 (5,0%)	1 (1,5%)	0	0
Extrasystole	3 (3,8%)	0	0	0
2. Electric axis position:				
Normal	19 (23,8%)	15 (22,7%)	39 (48,8%)	28 (42,4%)
Vertical	61 (76,2%)	51 (77,3%)	41 (51,2%)	38 (57,6%)
3. Incomplete blockade of the branches of the Hiss bundle	18 (22,5%)	14 (21,2%)	13 (16,2%)	6 (9,1%)
4. Impaired repolarization	52 (65,0%)	48 (72,7%)	27 (33,8%)	23 (34,8%)

* - differences are not significant: $\chi^2 = 14.97, p > 0.05$

** - differences are not significant: $\chi^2 = 4.87, p > 0.05$

RESULTS AND DISCUSSION

Heart arrhythmia, predominantly respiratory, persisted in 8.2% of cases, and no pathological rhythm disturbances were detected during the repair stage of the pneumonic process. The electrical axis of the heart continued to maintain a vertical position in 54.1% of cases (79 patients), signs of intracardiac conduction disturbances were determined in 19 children (13.0%), and disorders of repolarization processes persisted in 50 patients (34.2 %) [3].

Both in low-altitude conditions and in patients living in high-mountain regions of the Republic, unidirectional electrocardiographic changes were observed. Statistical analysis did not reveal significant differences among these groups of patients both in the acute stage of the disease and in the period of repair of the inflammatory process in the lungs. A comparative analysis of ECG indicators allows us to state that the most characteristic changes in the electromechanical activity of the heart in complicated forms of acute pneumonia in children are tachycardia, isorhythmia, vertical position of the electrical axis of the heart, incomplete blockade of the conduction pathways of the heart, mainly the right branch Hiss bundle, disruption of repolarization processes and metabolic processes in the myocardium.

To characterize the contractile function of the myocardium, an echocardiographic study was carried out in patients with acute pneumonia in low-altitude and high-altitude conditions.



As can be seen from the presented data, in low-altitude conditions in children with pneumonia, during the period of acute clinical manifestations, the main indicators characterizing hemodynamics and the state of myocardial contractile function decrease or remain at the level of control figures [4].

CONCLUSION

Thus, by comparing the data of echocardiographic studies in patients with pneumonia in low- and high-altitude conditions, it is possible to determine differences in the mechanisms of compensation for ventilation and circulatory hypoxia in patients at different altitudes. In children in low mountains, a hypovolemic (in other words, hyposystolic) hyperkinetic type of cardiohemodynamics is predominantly formed, and in high mountain people, a hypervolemic hyperkinetic type is formed. The latter, in our opinion, is less favorable due to the fact that it quickly leads to depletion of the reserve capabilities of the heart muscle, because on the circulation of large volumes of blood, with limited possibilities for compensating for energy costs, the work of the heart muscle increases, which must be taken into account in the complex treatment of acute pneumonia in young children, especially in high altitude conditions.

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