

CONDITION OF THE CARDIOVASCULAR SYSTEM IN CHILDREN BORN WITH PERINATAL CNS LESION

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Annotation: *Electrocardiographic and echocardiographic studies were carried out in 75 newborns with perinatal damage to the central nervous system in order to determine the relationship between the frequency and severity of the development of functional changes in the cardiovascular system and damage to the central nervous system. It has been established that the severity of changes is interrelated, which must be taken into account in the diagnostic process and prognosis.*

Key words: *newborns, central nervous system, cardiovascular system.*

Relevance. Many authors argue that newborns with perinatal damage to the central nervous system subsequently develop a functional disorder of the cardiovascular system [1,3]. There is also an increase in the number of children with perinatal damage to the central nervous system and, as a consequence, an increase in functional heart disorders [4,8]. Mainly, in newborns with ante- and intrapartum hypoxia, adverse effects on cardiomyocytes are detected [11,13]. If the pathology of the cardiovascular system is not diagnosed and treated in a timely manner, deeper disorders of its function occur in the future.

This is due to the complexity of the diagnostic and differential diagnostic search [1,3]. At the same time, long-term post-hypoxic damage can lead to the formation of focal cardiosclerosis, myocardial dystrophy, functional cardiopathy and electrical instability of the myocardium in children [3].

Considering the increase in perinatal damage to the central nervous system of various origins, including hypoxic, and the relationship with functional damage to the cardiovascular system, studying the state of the cardiovascular system and its interrelated treatment with the central nervous system is of great importance, which was the goal of our study.

Purpose of the study: to study the relationship between the functional state of the cardiovascular system and perinatal damage to the central nervous system in newborns.

Materials and methods of research. An examination was carried out for 75 newborns with hypoxic damage to the central nervous system of moderate and severe impairment, who were hospitalized at the Andijan Regional Multidisciplinary Medical Center in the period from 2021 to 2022. The exclusion criteria from the observation groups were newborns with congenital heart defects. Along with generally accepted clinical and laboratory studies, the cardiovascular system was studied with the determination of

electrocardiogram (ECG) and echocardiography (EchoCG) indicators. To clarify the damage to the central nervous system, neurosonographic and, if indicated, magnetic resonance imaging studies of the brain were performed.

Research results. The patients were divided into 2 groups. Group 1 consisted of 50 newborns with moderate central nervous system damage, of which 20 (40.0%) were boys and 30 (60.0%) girls, group 2 of 15 children with severe central nervous system damage, of which 8 (60, 0%) boys and 7 (40.0%) girls. The gestational age of newborns ranged from 38-40 weeks, weight 2900-4400 g, body length 41-47 cm. A complicated obstetric history was identified in 35 mothers (43.8%), pathological course of labor in 45 (90.0%) newborns, entanglement of the fetus with the umbilical cord in 11 (22.0%), fetal hypoxia was observed in 24 (48.0%), 31 (62%) were born with asphyxia of varying severity, intrauterine infections 8 (16%), with intrauterine growth retardation 19 (38%). Upon admission to the department, all children had CNS lesions, of which cerebral ischemia in 17 (34.0%) and intracerebral hemorrhages of varying localization and severity in 33 (66.0%). At the same time, neurological symptoms dominated in patients, including central nervous system excitation syndrome in 38 (76%) and depression in 14 (14%) newborns. Analysis of clinical and laboratory parameters reflecting the state of the cardiovascular system showed that in children of group 1, marbling of the skin in combination with acrocyanosis was present in 40 (80%), muffled heart sounds in 6 (12.0%), and in 17 (34. 0%) patients heard a soft systolic murmur along the left edge of the sternum.

An ECG study showed that sinus rhythm disturbances were present in 46 (92.0%), more often sinus tachyarrhythmia in 31 (62.0%), less often bradyarrhythmia in 5 (10.0%). All children in the same group had changes in the final part of the ventricular ST-T complex. Also, among other changes on the ECG, overload of the right ventricle was detected in 15 (30.0%), a decrease in the electrical activity of the myocardium in standard leads and precordial leads in 22 (44.0%), pathological P waves in 10 (20.0%), often high, pointed - in 15 (30.0%), which indicated a possible increase in pressure in the pulmonary circulation. According to echocardiography, studies in children of this group were identified. Also, in 23 (46.0%) children in this group, myocardial contractility was within normal limits.

Observation showed that in the dynamics of newborns of this group there was a positive dynamics of symptoms of damage to the central nervous system and the heart. In most children, microcirculatory disorders decreased, heart rhythm stabilized, and heart sounds became satisfactory. According to the ECG data, the parameters were normalized. When repeated echocardiography was performed in the majority of children 45 (90.0%) no deviations from the norm were noted. A slight increase in pressure in the pulmonary artery persisted in 2 (4.0%) children. In children of group 2, consisting of 30 newborns, peripheral microcirculatory disorders were detected in 11 (36.7%) children; muffled heart sounds of a rough nature were noted in 21 (70.0%) children. In all children of group 2, a short systolic murmur was heard at the left edge of the sternum. Among them there was a clinical

picture of intracranial hypertension in 20 (66.7%), severe depression of the central nervous system in 3 (10.0%), and convulsive syndrome in 5 (16.7%).

A comparative analysis of electrocardiographic data of children of group 2 revealed tachycardia with a heart rate in 14 (46.7%) and more than 170 beats/min was registered in 2 (6.7%) newborns (46.6%), and bradycardia in 4 (13.3%) and with a heart rate less than 100 beats/min. In 2 (6.7%). Overload and signs of hypertrophy of the right heart were noted in 3 (10.0%) newborns. Of the cardiac disorders, disturbances in repolarization processes were often detected in the form of changes in the final ST-T segment in 9 (30.0%), changes in intraventricular conduction in 8 (26.7%).

There were no pathological changes in the duration of the intervals. According to echocardiography, signs of pulmonary hypertension, myocardial hypertrophy, and impaired pumping and contractile function of the heart were observed significantly more often in newborns of group 2 than in group 1. The positive dynamics of the symptoms of functional and instrumental cardiac disorders in patients occurred in parallel with the severity of improvement in the neurological symptoms of perinatal damage to the nervous system. At the same time, the observed dynamics of the studied indicators occurred in group 2 much more slowly compared to group 1.

Thus, in newborns with perinatal damage to the central nervous system, there is a high frequency of development of functional changes in the cardiovascular system, while their severity and recovery depend on each other, which must be taken into account in the diagnostic process and prognosis.

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