

Factors influencing on formation of heart rhythm disturbances in newborns

*Kovalev I.A., Svintsova L.I., Usenkov S.Yu.
Child's Heart Center, Institute of Cardiology, Tomsk, Russia*

Objective: To determine risk criteria of formation and advance of heart rhythm disturbances in newborns.

Methods: Data of gynecologic and obstetric history, ECG, 24-hour monitoring with assessment of rhythm variability, Echo, neurosonography, thyroid hormones, markers of myocardial damage and antibodies to myocardium tissue tests are used.

Results: 102 patients (14 healthy incl.) were examined. Extrasystoles had the most specific gravity in the structure of idiopathic arrhythmias in newborns – 32,4%. Bradyarrhythmias were 25,7%, tachyarrhythmias – 22,9%, WPW syndrome – 18,9%. Rhythm disturbances preserve only in 5,4% by the sixth month of life. Longer persistence is typical for extrasystole and WPW syndrome.

Heart rhythm disturbances are marked much more often in newborns whose mothers had acute respiratory disease during pregnancy ($p=0,049$), and who were born from the primipregnancy ($p=0,041$). Bradyarrhythmias and tachyarrhythmias have similar factors which can potentially favor arrhythmia manifestation: intracranial hypertension according to neurosonography and changes of hormonal profile of thyroid body towards hypofunction. Established fact that higher value of systolic pressure in the right ventricle (average 28,38 mmHg ($p=0,047$)) is the peculiarity of intracardiac hemodynamics in the group of newborns with heart rhythm disturbances.

Presence of extrasystole in newborns is related with increase of troponin level I ($p=0,015$) and activation of parasympathetic link of vegetative nervous system (increase of pNN50 ($p=0,009$) and SDNNi ($p=0,037$) in comparison with healthy children).

Association of bradyarrhythmias with level of myocardial antinuclear antibodies in blood ($x_2=4,89$; $p=0,027$) are marked for fact in newborns. This fact says for significance of immune factor in damage of myocardium and its conduction system.

Conclusion: Thus, autoimmune component is important link of bradyarrhythmias pathogenesis, which, probably, is formed into antenatal period with the help of maternal antibodies. Destructive processes in myocardium, accompanying by increase of troponine I level in blood serum, and also activation of parasympathetic link of vegetative nervous system during extrasystole depend, on the contrary, on factors connecting with intra- and postnatal periods. Infection during pregnancy can influence, indirectly, on the process abnormality of obliteration of additional conduction tracts at WPW syndrome.