

Condition of Vegetative Regulation of Cardiac Activity in Newborns with Heart Rhythm Disorders

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Evaluation of heart rate variability is a method of assessing the state of the mechanisms of regulation of physiological functions in the body. Neonatal arrhythmias can cause life-threatening conditions.

Objective: To clarify the mechanisms of development of heart rhythm disorders in newborns by assessing the state of autonomic regulation of cardiac activity.

Materials and Methods: Holter ECG, analysis of heart rate variability (SDNN, SDANN, SDNN indices, rMSSD, pNN50), statistical analysis.

Results: The study involved 187 newborns with cardiac rhythm disturbances at auscultation of the heart. All the newborns were administered Holter ECG, following which they were divided into 2 groups. Group 1 (n = 126) - newborns with heart rate and conduction impairment, Group 2 (n = 61) - newborns with no rhythm and conduction disorders. Taking into account the gestational period, Group 1 and 2 newborns were divided into subgroups of full-term and pre-term infants: Group 1a - full-term with arrhythmia (n = 34), Group 1b - pre-term with arrhythmia (n = 92), Group 2a - full-term without arrhythmia (n = 24), Group 2b - pre-term without arrhythmia (n = 37). SDNN and SDANN factors, SDNN and pNN50 indices were higher in the subgroups of full-term newborns (46,5 [33,0; 64,0] and 46,0 [31,0; 54,0]; 28,5 [19,0; 35,0] and 27,0 [20,5; 36,0]; 34,0 [21,0; 53,0] and 34,5 [21,5; 39,5]; 1,01 [0,33; 5,66] and 0,8 [0,31; 2,73]). The rMSSD values were higher in the 1a subgroup (16,5 [11,0; 40,0]), which indicated a higher activity of the parasympathetic link of the autonomic nervous system in full-term infants with arrhythmias.

Conclusions: Assessment of heart rate variability in newborns is an important component of the characteristics of the heart rate; gestational immaturity of the vegetative centers and imbalance of the vegetative regulation are arrhythmogenic factors.