INFORMATION TECHNOLOGY FOR DEFINITION OF PAROXYSMAL CARDIAC ARRHYTHMIAS IN ITS EARLY STAGE

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Diagnosis of disorders of the conduction system of the human heart is one of the most important tasks of cardiology and is associated with a high percentage of sudden deaths of people of working age.

One of the generally accepted methods for detecting such disorders is the analysis of arrhythmias: determination of the occurrence of a heart rhythm disorder and classification of this disorder. However, one of the complex conduction abnormalities to detect is a paroxysmal heart disorder, which can occur by chance.

The difficulty lies in the fact that in the early stages, this deviation is similar to other types of arrhythmias. Thus, the identification and differentiation of Paroxysmal Cardiac Arrhythmias in the early stages is an urgent scientific and practical task.

Information technology (IT) for determining paroxysmal cardiac arrhythmias in the early stages based on spectral analysis of an electrocardiogram and metabolic indicators, which allow to identify initial paroxysmal disorders of the heart and increase the effectiveness of treatment and prophylactic measures, is proposed.

The equations of discriminant functions as the decisive rule of differentiation of the type of paroxysms were used and has form

$$F1 = 0.191 \cdot X1 + 0.554 \cdot X2 + 0.775 \cdot X3 + 0.084 \cdot X4 + 0.355 \cdot X5 - 0.141 \cdot X6 + 0.771 \cdot X7 - 68.656,$$

$$F2 = 0.242 \cdot X1 + 0.598 \cdot X2 + 0.719 \cdot X3 + 0.105 \cdot X4 + 0.198 \cdot X5 - 0.127 \cdot X6 + 0.634 \cdot X7 - 65.835.$$

where X1 is patient weight; X2 is HR; X3 is LF/HF index; X4 is basic ferritin content of red cells; X5 is albumin level; X6 is IgA level; X7 is result of C-reactive protein test. In values of F1> F2, with a probability of 94.54%, Persistent Tachycardia is diagnosed, otherwise initial Paroxysmal Atrial Tachycardia is diagnosed.

As a result of experimental verification of the developed technology, a diagnostic sensitivity was established on 95,34% and 94,07% for specificity, and the prognostic error was 3,1%.

Thus, the information technology for definition of Paroxysmal Cardiac Arrhythmias in its early stage had been develop and allows to detect paroxysms in the early stages and helps to decide on the necessary preventive measures in order to reduce disability and prevent death.