EVALUATION OF THE RISK OF CARDIOVASCULAR DISEASES BY PSYCHOPHYSIOLOGICAL AND PSYCHOMETRIC METHODS

Marina Artemieva, Svetlana Aleksandrova, Pavel Ogurtsov, Irina Kurnikova, Marina Aleksandrova & Gennady Ivanov

"RUDN University" - Peoples' Friendship University of Russia, Moscow, Russia

The use of a functional metabolic adaptation monitor is to assess the risk of cardiovascular diseases and quality of life of patients. Cardiovascular diseases remain the most pressing health problem for most countries of the modern world, including Russia.

Evaluation of quality of life (based on questionnaire SF 36) is wide-spread and can also help to choose effective treatment strategies for patients with cardiovascular diseases (CVD).

The problem of high mortality is directly related to late diagnosis, therefore, special attention in modern scientific research is paid to identifying predictors of cardiovascular diseases and improving methods of early diagnosis, including psychophysiological and psychometric methods because it includes psychosomatic disorders.

The integral myocardial index (IMI) is one of the indicators for assessing the state of the cardiovascular system, according to the functional metabolic adaptation monitor (FMAM), which was determined by the Cardiovisor technique.

The FMAM consists of a PC and software with four modes:
1. "Cardiovisor" - to assess microalterations in ECG data;
2. The assessment of heart rate variations;
3. The assessment of impulse speeds;
4. The assessment of intracellular and extracellular fluid balance.

The monitor uses four electrodes to take ECG data over ten minutes, both in a horizontal and sitting position, that is then processed by the software to give results from all four modes. This allows for the psychometric evaluation of the psychophysiological state of the patient in real time.

The study was a prospective observational controlled study.

There were 145 patients in the study who were divided into three groups: the observation group, which included 30 patients with cardiovascular diseases up to 65 years (observation group 1) and 34 patients with cardiovascular diseases after 65 years (observation group 2) , the comparison group consisted of 29 people without initially diagnosed cardiovascular diseases up to 65 years (comparison group 1), 23 patients without cardiovascular diseases after 65 years (comparison group 2), the third, control group, which consisted of 29 healthy people the age of 45 years.

IMI in the observation group 1 was 18 (17; 19) %, the observation group 2 was 24 (17, 32) %, the comparison group 1 was 16 (15, 17) %, the comparison group 2 was 17 (16, 17) %, the control group - 14 (14; 15) %. The quality of life of patients from both observation groups is low for integral indicators, such as "physical and mental components of health", "social functioning" (according SF 36).

The physical component of health in observation group 2 patients is 49.81%, and in observation group 1 patients – 38.24% ($p \leq 0.05$). A significant difference in the mental health component is observed: in the second group – 38.9%, and in the first group – 31.10% ($p \leq 0.05$).

Patients with CVD suffer usually from neurotic disorders: depression, memory impairment, attention disorders are more common, therefore the mental health component of the quality of life of patients with CVD decreases suffers.

The index of IMI allowed us to reveal significant differences in the values of this indicator both in patients within the observation group and in comparative evaluation with similar age groups of patients without cardiovascular pathology and patients in the control group. The highest level of IMI was observed in patients of the observation group 1 - 18% and observation group 2 - on average 24% with significant differences ($p < 0.05$) in relation to the indicators of patients in the comparison group ($p < 0.05$) and control ($p < 0.05$).

The threshold value according to the ROC-curve of IMI was 17.5%, confidence interval was 0.786-0.912, the specificity was 92.6%, and the sensitivity was 62.5%.

In patients with CVD, IMI was 40% higher. The IMI should be attributed to the early predictors of cardiovascular diseases and with an increase in the rate of IMI by more than 30%, the patient should be included in the risk group with a recommendation from a cardiologist for more targeted examination. Patients with CVD and patients with risk of developing CVD need to develop a multidisciplinary program to manage patient data involving endocrinologists, neurologists and psychotherapists, because such patients are often emotionally labile, which reduces their quality of life and worsens the prognosis of the underlying disease.