



Prognostic Significance and Advantage of Echocardiography in The Diagnosis of Ischemic Heart Disease

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ABSTRACT

The control group consisted of 20 conditionally healthy patients aged 60 years (49.1 ± 2.98) without clinical manifestations of coronary artery disease and the absence of its main risk factors. Depending on the clinic, the results of the study, the patients were divided into 2 groups. Group I patients consisted of 20 conditionally healthy men aged 37 to 61 years (49.2 ± 2.87) with two risk factors for IHD. Group II included 20 men aged 39 to 64 years (49.5 ± 3.01) with typical bouts of exertional angina. All the examined patients underwent tissue stress-DehoKG technique with physical activity. Physical activity according to the method was used as a stress agent.

Keywords:

cardiovascular diseases (CVD), ischemic heart disease, dobutamine, stress-echocardiography, stress-dehoCG, dipyridamole.

The problem of diagnosis and treatment of cardiovascular diseases (CVD) remains in the first place, despite the successes in the development of the cardiology service and the use of new drugs. Today, 18.7 million people died from CVD in the world in 2018 alone, of which 9 million 387 died from coronary heart disease (CHD). The mortality rate from these diseases in the countries of the Central Asian region also remains extremely high. The forecast of mortality from coronary heart disease in the world for 2021 was 11 million people. According to the ANA/ACC and the US National Institutes of Health, despite the huge funds (60 billion \$), spent annually by the United States on the treatment of coronary atherosclerosis, more than 5 million people suffer from coronary heart disease in the United States.

One of the ways to reduce mortality from coronary heart disease is early diagnosis and timely treatment. There are various algorithms

for the diagnosis of coronary heart disease both in our country and abroad (Sedov V.P., Alekhine M.N., Korneev N.V., 2000) and in the USA (AHA/ACC 2007), including mandatory stress echocardiography (stress echocardiography) before performing selective coronary angiography (CAG). The sensitivity of standard samples (dobutamine with atropine, dipyridamole with atropine) is relatively low and is about 80.0% (Sedov V.P., Alekhine M.N., Korneev N.V., 2000). Given the mechanism of action of dipyridamole ("intercoronary theft syndrome"), and dobutamine (stimulation of adrenoreceptors, leading to an increase in myocardial oxygen demand), their combination as stress agents during stress echocardiography is advisable.

To exclude false positive and false negative results of the diagnosis of coronary heart disease, stress echocardiography should have high sensitivity and specificity.

According to many literature sources, the sensitivity of stress echocardiography with physical activity is 91.0% (Alekhine M.N. 2003, Hecht H.S. 1993, Gani F. 2007, Leischik R. 2007, Picano E. 2007), which is significantly higher than with pharmacological tests. However, there is a group of patients who are not able to perform this type of research. This contingent was shown to undergo stress echocardiography with pharmacological samples (dipyridamole, dobutamine).

The purpose of the study: to study the role and possibilities of stress Doppler echocardiography in the diagnosis of coronary heart disease.

Materials and methods of research. The control group consisted of 20 conditionally healthy patients aged up to 60 years (49.1 ± 2.98) without clinical manifestations of coronary heart disease and the absence of its main risk factors. Depending on the clinic, the results of the study, the patients were divided into 2 groups. Group I of patients consisted of 20 conditionally healthy men aged 37 to 61 years (49.2 ± 2.87) with the presence of two risk factors for the development of coronary heart disease. Group II included 20 men aged 39 to 64 years (49.5 ± 3.01) with typical attacks of angina pectoris. All the examined patients were subjected to the technique of tissue stress DehoKG with physical activity. Physical activity according to the method was used as a stress agent. Beta-blockers, cardiac glycosides, calcium antagonists and nitrates were canceled for the patient 2 days before stress echocardiography. Tissue stress echocardiography was performed in visualization mode from a parasternal position at the level of papillary muscles along the long axis (PLax) and short axis (SaxPM), apical 4-chamber (4Ch) and 2-chamber (2Ch) positions, as well as using the pulse-wave mode of the longitudinal tissue Doppler. Systolic regional parameters of myocardial contractility were determined in the main blood supply basins: anterior descending artery (PNA), circumflex artery (OA), right coronary artery (PKA). The

increase in the maximum segmental systolic velocity (MCI) for each segment at all stages of the stress test was estimated. The tissue stress echocardiogram test was considered positive with a decrease in MSS for any of the segments at the subsequent stage of the sample.

The results of the study. Indicators of MCI at rest with stress-echocardiography in the control group ($n=20$). Indicators of MCI at different stages of stress DECHOEG in the control group there is a direct linear relationship between the increase in MCI and the stress test stage. Thus, there is an increase in MSS by an average of 1.31 times, and with a combined stress-echocardiogram test – by an average of 1.87 times. In patients without clinical manifestations of coronary heart disease with the absence of major risk factors with a positive VEM test ($n=20$), the sensitivity and specificity of combined stress echocardiography amounted to 100% ($p<0.001$). It was found that 90.0% of patients in this group with pathological changes in the ST segment had no coronary artery lesion ($p<0.05$). In the group of patients with first-time angina pectoris, the presence of 2 or more risk factors for coronary heart disease and a negative VEM test, atherosclerotic CA lesion was noted in 70.0%. The results of combined stress echocardiography fully corresponded to those of CAH in terms of both the localization of the affected artery and the prevalence of the pathological process ($p<0.001$).

Conclusion. Stress echocardiography is the preferred imaging technique due to its lower cost, wide availability and, most importantly, the absence of ionizing radiation. Combined stress-Doppler echocardiography can be successfully used both to form groups of patients subject to coronary angiography and to evaluate the effectiveness of angiosurgical treatment of coronary artery disease.

Literature

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