

Stress echocardiography in the assessment of coronary artery stenosis in patients with stable coronary heart disease

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Abstract

Objective: assessment of the significance of coronary artery stenosis by stress echocardiography (stress EchoCG).

Materials and Methods: The study included 1529 people with stable coronary heart disease (CHD). All patients underwent stress echocardiography with pharmacological (dobutamine) or physical (bicycle ergometer (BEM), treadmill) load to assess the condition of the myocardium, before the study, each patient had their blood pressure measured to determine the presence of hypertension. Some patients – 1212 (79.27%) underwent coronary angiography.

Results: Arterial hypertension of varying degrees was detected in 53.83% of the examined patients. According to the results of stress echocardiography, 996 (65.17%) patients had a positive test (no increase in contractility), coronary artery stenosis of more than 50% was detected in 530 (53.21%) of them. The majority also had diastolic dysfunction of the left ventricle (98.41%). Normal diastolic function was detected in 1.59% of the examined patients, only twelve of them underwent coronary angiography, according to the results of which stenosis of the anterior interventricular branch was detected. The accuracy of the method was 92.72%, sensitivity – 93.81%, specificity – 72.02%.

Conclusion: Stress echocardiography has demonstrated a fairly high level of accuracy, sensitivity and specificity, which indicates the need to perform this procedure in all patients with suspected coronary heart disease with an average and high pre-test probability in order to reduce the number of coronary angiographic studies.

Keywords: Stress Echocardiography, Coronary Angiography, Coronary Heart Disease, Stenosis

Mini Review

When conducting ROC analysis to determine the sensitivity and specificity of stress echocardiography in relation to the assessment of coronary artery stenosis, it was found that the reliability of the method was 92.72%, sensitivity – 93.81%, specificity – 72.02%, $p < 0.001$ (Figure 1).

Table 1: Age of patients who underwent stress echocardiography and coronary angiography.

Age, years	Number of people who underwent stress echocardiography.	Number of people who underwent coronary angiography	
		Person	%
30-40	21	11	52,38
40-50	138	76	55,07
50-60	364	278	76,37
60-70	727	647	89,00
70-80	274	195	71,17
80-90	5	5	100
Итого:	1529	1212	79,27

Table 2: Number of patients with arterial hypertension according to classification of arterial pressure levels.

Classification of blood pressure levels	Number of people.	%
Optimal	116	7,58
Normal	290	18,97
High normal	300	19,65
AG 1 degrees	422	27,59
AG 2 degrees	137	8,97
AG 3 degrees	0	0
Isolated systolic hypertension	264	17,24

Table 3: Presence of coronary artery stenosis in patients with a positive stress echocardiography test.

Positive test with coronary angiography	Number of people.	%
Stenosis more than 50%	530	53,21
Less than 50%	181	18,17

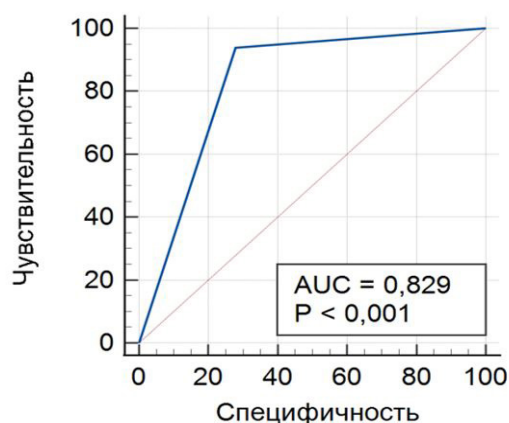
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Table 4: Assessment of diastolic function of the left ventricle during stress echocardiography.

Left ventricular diastolic function	Number of people	%
Left ventricular diastolic dysfunction	1505	98,41
Normal left ventricular diastolic function	24	1,59

Figure 1: ROC analysis curve for assessing the sensitivity and specificity of stress echocardiography.



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