



Application effect of treadmill exercise test in diagnosis of coronary heart disease patients

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Abstract

Objective: To analyze the results and value of treadmill exercise test in diagnosis of coronary heart disease.

Methods: 74 cases of coronary heart disease patients admitted to our hospital as the research object, the use of treadmill exercise test, coronary angiography, observation of diagnostic results, as well as the diagnostic accuracy of different coronary lesions.

Results: the sensitivity of treadmill exercise test was 68.4%, the specificity was 58.3%, the positive predictive value was 63.4%, the negative predictive value was 63.6%, the diagnostic accordance rate was 63.5%. The diagnostic accuracy of the 61.1%, 75.8%, 100%, 94.4%, and three, respectively, were negative, single vessel lesion, double vessel lesion and lesion.

Conclusion: treadmill exercise test is feasible and easy to be used in the diagnosis of coronary heart disease, but it can be used as a supplementary means.

Keywords: Coronary heart disease, treadmill exercise test, coronary angiography, application value

Introduction

According to the clinical diagnosis of coronary heart disease, coronary angiography is the gold standard, which can provide scientific basis for the treatment and prognosis of patients. However, the examination is a invasive examination, not only the repetitive operation is poor, and the risk of complications, so patients with low compliance [1]. In this context, the treadmill exercise test in clinical applications, a good effect, this paper admitted to our hospital were 74 patients, to explore the diagnosis results and the application value and a detailed report is as follows:

Data and Methods

General data of patients with coronary heart disease admitted to our hospital from January 2022 to December 2023, a total of 74 cases of patients. Among them, 40 cases (54.1%), female 34 cases (45.9%) were in the age of 78 to 30 years old, the average age was (54.8 + 2.2) years old, 46 patients with stable angina pectoris and 28 patients with unstable angina. Cardiac function classification: II grade 29 cases, III grade 34 cases, IV grade 11 cases; 12 cases with hypertension, 7 cases of high blood lipids, 20 cases of diabetes.

The inclusion and exclusion criteria

1. The inclusion criteria: according to the ischemic heart disease nomenclature and criteria for diagnosis of "[2], patients aged 18-80 years, before the examination 1 week deactivated affect heart rate drugs; voluntary participation this study, able to actively cooperate with the doctors.
2. The exclusion criteria: Patients with mental disorders, hepato renal functional changes in patients with myocardial infarction, valvular heart disease, left bundle branch block patients.

Research methods were used to patients with treadmill exercise test, coronary angiography, observation and comparison of diagnostic results.

Treadmill exercise test selection of CASE tablet movement detection system (GE), respectively, in the pre exercise, exercise, and exercise after the determination of blood pressure and 12 lead ECG, and compared. Encounter the following situations when the termination of the movement: the patient's heart rate reaches the target value. The occurrence of myocardial infarction; angina or ST segment decrease 3mm; hypertensive response, SBP, DBP levels in more than 260mmHg 115mmHg, or systolic pressure was significantly lower, down more than 10 mmHg; arrhythmia phenomenon; inadequate systemic perfusion phenomena appear, such as: chills, cyanosis, shortness of breath and so on.

Coronary angiography use Innova2000 angiography machine (GE), the standard judkin method, on patients with femoral artery or radial artery for angiography. Through multiple position projection, respectively to evaluate the degree of stenosis of the artery, anterior descending coronary artery, circumflex artery, right coronary vascular cavity.

Diagnostic criteria

Treadmill exercise test positive criteria are as follows [3]: first, patients with anginal symptoms; second, exercise, after exercise ECG ST segment or oblique downward 1mm above, lasted for more than 2 minutes; third, before exercise ST segment showing a lack of blood group down in 0.1mv, lasted for more than 2 minutes; fourth, movement in systolic blood pressure decreased more than 10 mmHg, ST segment level down more than 0.05mV.

Coronary angiography positive criteria are as follows: [4] coronary artery stenosis is more than 50% that of coronary heart disease, the degree of stenosis in the 50%-75% for mild, narrow degree of 76%-99% is severe, the degree of stenosis 100% is blocked.

Statistical methods by using statistical analysis software SPSS (version 18.0), count data using (n, %) said, inter group comparison were analyzed by chi square test; measurement data using (x + s) said, inter group comparison t-test. P < 0.05 shows significant difference.

Results

Diagnostic results and the comparison results show that the coronary angiography were positive in 38 cases, 36 cases were negative; treadmill exercise test were detected positive in 41 cases, 33 cases were negative, the sensitivity was 68.4%, the specificity was 58.3%, the positive predictive value was 63.4%, the negative predictive value was 63.6%, diagnostic coincidence rate was 63.5%. Detailed data see table 1.

Table 1: Comparison of the diagnostic results of the 1 patient (n, %)

Treadmill exercise test	Coronary angiography		Total
	Positive	Negative	
Positive	26	15	41
Negative	12	21	33
Total	38	36	74

Diagnostic accuracy analysis showed that 41 cases were positive for treadmill exercise test, 30 cases were positive for coronary angiography, including 11 cases of single vessel disease, 16 cases of double vessel disease, three cases of 3 lesions. Treadmill exercise test was negative in 33 cases, 8 cases were detected by coronary angiography, including 7 cases of single vessel disease, 1 cases of double vessel disease. Its accuracy rate is 75.8%, 61.1%, 94.4%, 100%, detailed data see table 2.

Table 2: Analysis of the degree of coronary artery disease (n, %)

CAG Result	Test	Test	Accuracy Rate
	Positive (n=41)	Negative (n=33)	
Negative	11	25	75.8%#
SVD	11	7	61.1%#
DVD	16	1	94.4%
TVD	3	0	100%

Note: Comparison of three lesions, #P<0.05.

Discussion

Treadmill exercise test and other examination methods, compared with non invasive, simple operation, low cost advantages, combined with coronary angiography can improve the accuracy of diagnosis. The data showed that 41 cases were positive, 33 cases were negative, the sensitivity was 68.4%, the specificity was 58.3%, the diagnostic accordance rate was 63.5%. In different degree of coronary artery disease, the accuracy of the three lesions was 100%, the single and double support accuracy were 61.1%, 94.4%, respectively, the difference was statistically significant.

The analysis thinks, the principle of the test method is that through exercise on myocardial cause stimulation, increased in patients with myocardial oxygen consumption, the load on the heart close to or reach maximum blood supply level, and relative of appear coronary blood supply shortage phenomenon. Finally an [5] diagnosis of coronary heart disease was made. For the cases of misdiagnosis, its reason mainly includes the following several points: is amount of exercise is not standard; second is exist in the patients with microangiopathy; three patients in coronary artery stenosis

at the same time, function of coronary collateral circulation is strong, can make up for coronary artery stenosis caused by blood supply shortage phenomenon; four patients with single vessel stenosis is light, such as localized stenosis, stenosis in vascular distal, so the extent of ischemic small. In the study of Zhang wing, said [6], in addition, the accuracy of the diagnosis of the results will be affected by gender factors, the accuracy of the diagnosis of male patients is higher than the female patients. Prompt physicians in practice to consider all aspects of the operation, can not be blindly to make the final diagnosis of the test results. To sum up, treadmill exercise test is feasible, simple but sensitive and specific, and can be used as a supplementary means of coronary heart disease.

References

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