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Clinical Study on the Treatment of Coronary Heart Disease with Atorvastatin Calcium Tablets in Combination with Cardiovascular Drugs

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Abstract: Because the incidence of coronary heart disease is gradually increasing, its harm has been widely paid attention to, coronary heart disease is generally treated by drug therapy, so modern clinical focus on the study of coronary heart disease patients with drug therapy effect. In this study, 80 patients with coronary heart disease admitted to our hospital from November 2022 to November 2023 were selected. After randomization, the control group was given single drug treatment, while the observation group was required to take atorvastatin calcium tablets combined with cardiovascular drugs. Blood lipid indexes [triglyceride (TG), total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), albumin] before and after treatment were compared between the two groups. Cardiac function indicators (left ventricular end-diastolic volume (LVEDV), left ventricular end-systolic diameter (LVESV), left ventricular ejection fraction (LVEF)) before and after treatment; Hemorheological parameters (hemoglobin (Hb), hematocrit (HCT), erythrocyte volume (MCV), platelet count (PCT)) before and after treatment; Total effective rate of treatment; The incidence of adverse reactions was analyzed, and then the therapeutic effect of atorvastatin calcium tablets combined with cardiovascular drugs was analyzed. Through analysis, it was found that after treatment, blood lipid indexes, cardiac function indexes and hemorheology indexes of patients in the two groups were significantly improved compared with those before treatment, and the above indexes of patients in the observation group were superior to those in the control group. At the same time, the total effective rate of clinical treatment in the observation group was higher than that in the control group, and the incidence of adverse reactions was lower than that in the control group, showing significant differences between the two groups. According to the results of this study, atorvastatin calcium tablets combined with cardiovascular drugs can improve the cardiac function and blood indexes of patients with coronary heart disease, and the clinical effect and safety are relatively high, which is worthy of promotion.

1. Introduction

Coronary heart disease is a cardiovascular disease with a relatively high incidence in clinical practice. The occurrence of this disease is mainly due to atherosclerotic reactions in the patient's

coronary arteries or local unstable plaques causing rupture. When patients develop coronary heart disease, they experience various clinical symptoms, including chest tightness, shortness of breath, and angina pectoris. Coronary heart disease progresses rapidly and has a relatively high incidence. If the patient's condition is severe, it can lead to arrhythmias, myocardial infarction, and other related diseases, posing a great threat to the patient's life. In clinical practice, percutaneous coronary intervention is generally performed for treatment, which can achieve good clinical results[1]. However, the rates of restenosis and rebleeding after the procedure are increased. According to relevant studies, the main causes of coronary heart disease are abnormal reactions in lipid indicators and coagulation function. Therefore, in clinical practice, lipid-lowering, anti-thrombotic, and anti-coagulation treatments are usually applied. Atorvastatin is a commonly used lipid-lowering drug that effectively improves patients' lipid levels and arterial atherosclerotic reactions. Trimetazidine is a vasodilator that regulates the metabolic function of myocardial cells. This study aims to analyze the application effect of atorvastatin calcium tablets in combination with trimetazidine. The following research has been conducted[2].

2. Data and Methods

2.1 General Information

Eighty cases of coronary heart disease patients admitted to our hospital from November 2022 to November 2023 were selected. They were divided into two groups using a random number table method. The control group (n=40) was treated with simvastatin, with an age range of 55-80 years and an average age of (68.49±5.16) years. There were 24 male patients and 16 female patients. The duration of the disease ranged from 1 to 7 years, with an average of (3.56±0.76) years. The observation group (n=40), in addition to the treatment given to the control group, received atorvastatin calcium tablets. The age range was 55-80 years with an average age of (68.81±5.32) years. There were 26 male patients and 14 female patients. The duration of the disease ranged from 1 to 8 years, with an average of (3.68±0.79) years. There was no significant difference in general data between the two groups (P>0.05).

Inclusion criteria: ① Diagnosed with coronary heart disease through comprehensive clinical imaging techniques; ② Complete clinical data; ③ No history of surgical procedures or traumatic injuries to other diseases in the three months prior to the study; ④ Informed about the study and signed the informed consent form[3].

Exclusion criteria: ① Accompanied by relevant heart diseases such as myocardial infarction; ② History of previous coronary artery bypass grafting; ③ Abnormal reactions in important organ functions; ④ History of allergies to the study drugs; ⑤ Presence of malignant tumors; ⑥ Presence of psychiatric disorders[4].

2.2 Methods

Before treatment, both groups of patients need to rest, remain calm, receive oxygen therapy, undergo electrocardiogram monitoring, and be treated with diuretics and anticoagulants.

Control group: Treated with simvastatin, orally administered 20mg with warm water three times a day [5].

Observation group: In addition to the treatment in the control group, treated with atorvastatin calcium tablets, orally administered 20mg before bedtime once daily. If the patient experiences abnormal liver function reactions, the dosage should be reduced to 10mg once daily[6].Both groups of patients need to continue medication for one month.

2.3 Observational Indicators

① Comparison of lipid indicators before and after treatment [triglycerides (TG), total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), albumin]: On the day before the examination, fasting was maintained from 10 p.m., and on the next day, venous blood samples were collected from the patients after 8 a.m., with a collection volume of 5ml, centrifuged at 3000r/min for biochemical testing;

② Comparison of cardiac function indicators before and after treatment [left ventricular end-diastolic volume (LVEDV), left ventricular end-systolic diameter (LVESV), left ventricular ejection fraction (LVEF)]: Detected using echocardiography;

③ Comparison of hemorheological indicators before and after treatment [hemoglobin (Hb), hematocrit (HCT), mean corpuscular volume (MCV), plateletcrit (PCT)]: On the day before the examination, fasting was maintained from 10 p.m., and on the next day, venous blood samples were collected from the patients after 8 a.m., with a collection volume of 5ml, centrifuged at 3000r/min for biochemical testing;

④ Comparison of total effective rate of treatment: Effective: No abnormalities detected after electrocardiogram examination, and all clinical symptoms completely disappeared or significantly improved, ST segment on electrocardiogram exceeded 0.15mV; Effective: Significant improvement in ST segment and certain degree of improvement in clinical symptoms such as palpitations after electrocardiogram examination; Ineffective: Abnormal results on electrocardiogram with no improvement in relevant indicators, or even worsening, frequency of clinical symptoms such as palpitations remains unchanged or increases;

⑤ Comparison of incidence of adverse reactions: Including angina pectoris, arrhythmia, and myocardial infarction [7].

2.4 Statistical Analysis

Analysis was conducted using SPSS 20.0 statistical software. Mean ± standard deviation (±s) represents quantitative data, t-test was used, and percentage (%) represents count data, X2 test was used. When $P<0.05$, the difference between the two groups of data is statistically significant[8].

3. Results

3.1 Comparison of lipid indicators before and after treatment

Table 1: Comparison of blood lipid indexes before and after treatment (±s)

group	number	TG(mmol/L)		TC(mmol/L)		LDL-C(mmol/L)		Albumin (g/L)	
		before treatment	after treatment	before treatment	after treatment	before treatment	after treatment	before treatment	after treatment
observation group	40	3.32±0.36	1.50±0.12	6.98±0.81	4.00±0.14	5.32±1.02	2.24±0.14	36.32±1.68	46.57±3.64
matched group	40	3.35±0.39	2.18±0.24	6.91±0.80	5.30±0.35	5.41±1.06	3.54±0.30	36.19±1.62	42.24±2.09
t	-	0.357	16.028	0.389	21.811	0.387	24.835	0.352	6.524
P	-	0.722	0.000	0.698	0.000	0.700	0.000	0.726	0.000

Before treatment, there was no statistically significant difference in the levels of TG, TC, LDL-C, and albumin between the two groups ($P>0.05$). After treatment, the levels of TG, TC, and LDL-C in the observation group were lower than those in the control group, while the level of albumin in the

observation group was higher than that in the control group, and the difference was statistically significant (P<0.05), as shown in Table 1.

3.2 Comparison of cardiac function indicators before and after treatment

Before treatment, there was no statistically significant difference in the levels of LVEDV, LVESV, and LVEF between the two groups (P>0.05). After treatment, the levels of LVEDV and LVESV in the observation group were lower than those in the control group, while the level of LVEF in the observation group was higher than that in the control group, and the difference was statistically significant (P<0.05), as shown in Table 2.

Table 2: Comparison of cardiac function indexes before and after treatment (±s)

group	number	LVEDV(mm)		LVESV(mm)		LVEF(%)	
		before treatment	after treatment	before treatment	after treatment	before treatment	after treatment
observation group	40	210.56±33.26	155.42±35.26	160.35±35.46	122.46±35.16	36.05±4.51	45.03±3.65
matched group	40	211.06±35.68	175.56±30.42	161.02±34.15	140.56±25.55	35.98±4.76	40.13±3.21
t	-	0.065	2.735	0.123	2.634	0.068	6.376
P	-	0.949	0.008	0.902	0.010	0.946	0.000

3.3 Comparison of hemorheological indicators before and after treatment

Before treatment, there was no statistically significant difference in the levels of Hb, HCT, MCV, and PCT between the two groups (P>0.05). After treatment, the levels of Hb, HCT, MCV, and PCT in the observation group were lower than those in the control group, and the difference was statistically significant (P<0.05), as shown in Table 3.

Table 3: Comparison of hemorheology indexes before and after treatment (±s)

group	number	Hb(g/L)		HCT(%)		MCV(fl)		PCT(%)	
		before treatment	after treatment	before treatment	after treatment	before treatment	after treatment	before treatment	after treatment
observation group	40	152.24±17.09	125.35±7.55	55.26±4.07	42.54±2.75	119.32±9.90	92.98±7.52	4.39±0.85	2.11±0.61
matched group	40	151.19±14.35	132.89±9.44	55.75±4.35	45.67±3.29	118.43±10.46	102.34±7.67	4.35±0.54	2.83±0.77
t	-	0.298	3.945	0.520	4.617	0.391	5.511	0.251	4.636
P	-	0.767	0.000	0.604	0.000	0.697	0.000	0.802	0.000

3.4 Comparison of total effective rate

Observation group: 97.5% (39/40), with 23 cases showing marked effectiveness, 16 cases showing effectiveness, and 1 case showing ineffectiveness. Control group: 70.0% (28/40), with 19 cases showing marked effectiveness, 9 cases showing effectiveness, and 12 cases showing ineffectiveness. The total effective rate of treatment in the observation group was higher than that in the control group, with a statistically significant difference (P < 0.05);

Comparison of adverse reaction rates 2.5

Observation group: 5.0% (2/40), with 2 cases of angina patients. Control group: 27.5% (11/40), with 5 cases of angina, 3 cases of arrhythmia, and 3 cases of myocardial infarction patients. The incidence of adverse reactions in the observation group was lower than that in the control group, with a statistically significant difference (P < 0.05).

4. Conclusions

In recent years, the incidence of cardiovascular diseases in China has been increasing, with a noticeable rise in the prevalence of coronary heart disease. Coronary heart disease poses a serious threat to human life safety, with a high mortality rate. The population affected by this disease is becoming younger[9]. With changes in people's lifestyles and the combined influence of high work pressure and stress in the social environment, the occurrence of coronary heart disease has a significant impact on patients' quality of life. Most coronary heart disease patients also experience angina, mainly due to abnormalities in the patient's coagulation system function and abnormal platelet activation, leading to local plaque inflammation reactions. This results in atherosclerosis in the patient's arteries, reducing local myocardial blood flow and causing rupture of fibrous caps in coronary artery plaques, abnormal platelet aggregation, and ultimately spasm of the coronary arteries and a decrease in vessel diameter. Without timely and effective treatment of coronary heart disease patients in clinical practice, patients may experience more severe cardiovascular events[10]. Currently, in clinical practice, nitrate medications and antiplatelet drugs are generally used to treat coronary heart disease patients, or surgical intervention is performed to control the frequency of angina attacks and reduce the occurrence of other adverse events in patients[11].

Trimetazidine is a piperazine-class drug and a novel 3-AKT inhibitor in modern medicine. After using this drug, it regulates the metabolism of myocardial cells in patients, effectively alleviating various reactions caused by myocardial ischemia in coronary heart disease patients. When patients are treated with trimetazidine, it can enter myocardial cells, balance mitochondrial function, increase cellular energy supply, and significantly reduce the extent of damage in hypoxic and ischemic states. Furthermore, trimetazidine can enhance the efficiency of glucose metabolism in myocardial cells, even in the absence of raw materials in the body, by improving the utilization of glucose in the body. Additionally, the drug can further reduce the synthesis of substances such as endothelin and oxygen free radicals, actively improving the severity of myocardial ischemic injury and reducing the burden during myocardial movement. The active substance in trimetazidine, when in the bloodstream, can increase the utilization of oxygen by body cells, expand related metabolic pathways significantly, improve the patient's glucose conversion rate, and notably improve the abnormality in the hemodynamics of the patient[12].

Atorvastatin calcium tablets are commonly used lipid-lowering drugs in clinical practice. They can significantly reduce triglyceride levels, lipoprotein levels, and low-density lipoprotein levels in patients, effectively treating hyperlipidemia patients with good clinical effects[13]. Moreover, the drug can control inflammatory factors, improve vascular endothelial function, and prevent patients from developing cardiovascular-related diseases. Atorvastatin calcium tablets belong to hydroxy acids, which can be converted into lactones, effectively bind to hepatocellular cytochromes, form metabolites with strong hydrophilicity, improve the kidney's toxin clearance ability, enhance LDL receptor activity in liver cells, clear LDL-related indicators efficiently, and further improve the patient's lipid levels[14]. Additionally, once atorvastatin calcium tablets enter the patient's circulatory system, they react with enzymes associated with nitric oxide, generate positive stimulation, significantly increase the nitric oxide levels in coronary artery endothelial cells, further enhancing vessel dilation and improving blood flow in atherosclerotic plaques. By inhibiting endothelin synthesis, atorvastatin calcium tablets can relieve vascular endothelial dysfunction. Moreover, the drug can activate patient fibrinolysis, increase the dissolution efficiency of atherosclerotic plaques, clear blocked coronary arteries, directly act on atherosclerotic plaques, significantly enhance their stability, and prevent detachment reactions during plaque dissolution. This study found that the treatment and safety of patients in the observation group were superior to those in the control group, indicating that the combination of atorvastatin calcium tablets and trimetazidine can effectively enhance clinical outcomes and ensure medication safety. The above theoretical content explains the results of this study [15].

In conclusion, the treatment of coronary heart disease patients with atorvastatin calcium tablets

in combination with cardiovascular drugs is remarkably effective and safe, and it is worth promoting.

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