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Clinical Effect Analysis of Atorvastatin Calcium Combined with Ezetimibe Tablets in the Treatment of Coronary Heart Disease

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Abstract: *Objective:* To explore the effective drug treatment plan for patients with coronary heart disease. *Methods:* A total of 59 patients with coronary heart disease were recruited and divided into the study group (30 cases, treated with atorvastatin calcium combined with ezetimibe tablets) and the control group (29 cases, treated with atorvastatin) after drawing lots, and the therapeutic effects of the two groups were compared. *Results:* After treatment, the blood lipid level, cardiac function, inflammatory factor level, and clinical effective rate of the study group were better than those of the control group ($P < 0.05$); there was no significant difference in the incidence of adverse reactions between the two groups ($P > 0.05$). *Conclusion:* The clinical effect of atorvastatin calcium combined with ezetimibe tablets in the treatment of patients with coronary heart disease is significant, and it has the value of promotion and application.

Keywords: Atorvastatin; Ezetimibe tablets; Coronary heart disease

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1. Introduction

Coronary heart disease is an ischemic heart disease with a relatively high incidence in middle-aged and elderly people. Atherosclerosis occurs inside the coronary tissue of patients, blood circulation is blocked, and myocardial tissue is necrotic under ischemia and hypoxia, which can lead to symptoms such as angina pectoris. With the prolongation of the disease, it can induce arrhythmia, heart failure, and other critical diseases [1]. Drug therapy is the basic treatment plan for coronary heart disease; commonly used drugs include anti-myocardial ischemic drugs, antiplatelet drugs, etc. The latest clinical research shows that dyslipidemia is an important factor in the onset and progression of coronary heart disease, so it is necessary to add lipid-lowering drugs to the drug treatment plan [2]. Atorvastatin is a routine lipid-lowering drug. Some patients with coronary heart disease still have blood lipids beyond the normal range after taking the drug and have adverse reactions such as liver damage. Ezetimibe tablets are a new generation of lipid-lowering drugs, and some studies suggest that this drug can effectively regulate blood lipid levels in patients with coronary heart disease [3]. In this study, 59 patients with coronary heart disease were selected to analyze effective drug treatment options.

2. Materials and methods

2.1. General information

The study was carried out from May 2021 to December 2022. A total of 59 patients with coronary heart disease were recruited and divided into 30 patients in the study group and 29 patients in the control group after drawing lots. The numerical ratio of males to females in the study group was 18:12, the age was 60.44 ± 4.29 years old, and the disease course was 2.68 ± 0.55 years. The numerical ratio of males to females in the control group was 17:12, the age was 60.53 ± 4.32 years old, and the disease course was 2.62 ± 0.59 years. All patients met the diagnostic criteria for coronary heart disease in the relevant ACC/AHA guidelines, had no other organic lesions or blood system diseases, had no drug allergy, and had no drug treatment before enrollment. The general data of the two groups were comparable ($P > 0.05$).

2.2. Methods

Both groups received basic treatment for coronary heart disease, and antiplatelet and anti-myocardial ischemia drugs were used for intervention. If the patient's condition was in an acute attack stage, the doctor instructed him/her to rest in bed, concurrently inhale oxygen at a low flow rate, and take nitroglycerin sublingually. The patient's blood pressure, heart rate, electrocardiogram, and cardiac function changes were monitored, and any abnormalities were dealt with promptly.

The patients in the control group were treated with atorvastatin calcium at a dose of 10 mg/d. After 4 weeks of continuous medication, the patient's condition was evaluated and the dosage was adjusted. The maximum dosage was 80 mg/d, and the course of treatment was 3 months.

The patients in the study group were treated with ezetimibe tablets according to the protocol of the control group, the dose was 10 mg/d, and the course of treatment was 3 months. During the treatment period, doctors in the two groups provided health guidance to them, informed them about diet, exercise, and other knowledge, guided them to establish a healthy lifestyle, and told them to self-monitor their condition.

2.3. Evaluation criteria

The blood lipid levels, cardiac function, inflammatory factor levels, clinical effective rate, and incidence of adverse reactions were compared between the two groups.

2.4. Statistical methods

SPSS 23.0 software was used to analyze the research data, the measurement data are represented in mean ± standard deviation (SD), and *t*-test was used; count data are represented in %, and x^2 test was used. $P < 0.05$ indicated that there was a statistical level difference.

3. Results

3.1. Comparison of blood lipid levels between the two groups

As shown in **Table 1**, after treatment, the blood lipid levels of the study group were better than those of the control group ($P < 0.05$).

Table 1. Comparison of blood lipid levels between the two groups before and after treatment (mean ± SD, mmol/L)

Group	TC		TG		HDL-C		LDL-C	
	Before	After	Before	After	Before	After	Before	After
Study group (n = 30)	5.93 ± 1.25	4.08 ± 0.77	3.81 ± 0.79	1.72 ± 0.35	0.91 ± 0.13	1.41 ± 0.35	4.02 ± 0.85	2.04 ± 0.23
Control group (n = 29)	5.88 ± 1.29	5.14 ± 1.13	3.77 ± 0.82	2.24 ± 0.61	0.93 ± 0.16	1.08 ± 0.17	4.07 ± 0.79	2.76 ± 0.68
t-value	0.151	4.223	0.191	4.033	0.528	4.581	0.234	5.485
P value	0.880	0.000	0.849	0.000	0.600	0.000	0.816	0.000

Abbreviations: TC, total cholesterol; TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; LDL-C, low-density lipoprotein cholesterol.

3.2. Comparison of cardiac function and inflammatory factor levels between the two groups

As shown in **Table 2**, after treatment, the cardiac function and inflammatory factors in the study group were better than those in the control group ($P < 0.05$).

Table 2. Comparison of cardiac function and inflammatory factor levels between the two groups before and after treatment (mean ± SD)

Group	LVEF (%)		hs-CRP (mg/L)		FMD (%)		ET-1 (ng/L)	
	Before	After	Before	After	Before	After	Before	After
Study group (n = 30)	48.92 ± 5.74	55.38 ± 4.72	13.98 ± 2.25	1.48 ± 0.32	6.74 ± 1.12	8.49 ± 1.52	6.12 ± 1.08	4.08 ± 0.55
Control group (n = 29)	48.85 ± 5.79	48.96 ± 2.81	14.03 ± 2.19	2.36 ± 0.77	6.69 ± 1.18	7.03 ± 1.18	6.07 ± 1.13	5.09 ± 0.97
t-value	0.047	6.321	0.086	5.767	0.167	4.111	0.174	4.941
P value	0.963	0.000	0.931	0.000	0.868	0.000	0.863	0.000

Abbreviations: LVEF, left ventricle ejection fraction; hs-CRP, high-sensitivity C-reactive protein; FMD, flow-mediated vasodilatation; ET-1, endothelin-1.

3.3. Comparing the clinical efficiency of the two groups

As shown in **Table 3**, the clinical effective rate of patients in the study group was higher than that in the control group ($P < 0.05$).

Table 3. Comparison of clinical effective rates between the two groups [n (%)]

Group	Markedly effective	Effective	Ineffective	Total efficiency
Study group (n = 30)	19	9	2	28 (93.3)
Control group (n = 29)	14	7	8	21 (72.4)
x^2 value				4.584
P value				0.032

3.4. Comparing the incidence of adverse reactions between the two groups

As shown in **Table 4**, there was no significant difference in the incidence of adverse reactions between the two groups ($P > 0.05$).

Table 4. Comparison of the incidence of adverse reactions between the two groups [*n* (%)]

Group	Gastrointestinal reaction	Muscle ache	Rash	Incidence of adverse reactions
Study group (*n* = 30)	2	0	1	3 (10.0)
Control group (*n* = 29)	1	1	0	2 (6.9)
x^2 value				0.183
P value				0.668

4. Discussion

Coronary artery tissue is the artery that provides the heart with the blood it needs. For example, the plaque deposited inside the coronary artery can reduce the space for blood flow in the lumen, thereby inducing coronary heart disease. At present, affected by diet, environment, and lifestyle factors, the incidence of coronary heart disease is at a relatively high level. Most patients present with symptoms such as angina pectoris and chest pressure. If early treatment and intervention are not performed, symptoms such as arrhythmia, heart failure, and cardiogenic shock may be induced, and even sudden death may occur [4].

The clinical treatment of coronary heart disease mainly includes conservative drug treatment and surgical treatment. Patients with mild coronary artery stenosis usually use drug therapy, while patients with severe coronary artery stenosis or complete coronary artery occlusion need surgical treatment. With the deepening of pharmaceutical research, the types of drugs suitable for the treatment of coronary heart disease have increased significantly. Commonly used drugs include anti-platelet drugs such as aspirin and anti-myocardial ischemia drugs such as nitroglycerin [5]. Clinical studies have confirmed that hypercholesterolemia is an independent risk factor for the onset and progression of coronary heart disease. If the level of low-density lipoprotein cholesterol (LDL-C) can be effectively controlled, the incidence of adverse cardiovascular events can be reduced. Therefore, it is necessary to add lipid-lowering drugs to the drug treatment plan to improve the therapeutic effect [6]. Atorvastatin calcium is a lipid-lowering drug widely used in clinical practice. The drug composition can highly selectively inhibit 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA), making it unable to induce the synthesis of mevalonate, thereby blocking the cholesterol synthesis pathway, reducing the total amount of cholesterol synthesized by the liver, and effectively controlling the levels of lipoprotein and cholesterol in plasma. Atorvastatin calcium can also act on liver cells to increase the number of LDL receptors on the surface, promote the uptake of LDL, accelerate its catabolism, and block the synthesis of lipoproteins, thereby effectively controlling blood lipid levels. The role of atorvastatin calcium in regulating blood lipids is related to the dosage and sensitivity of the patient's body to the drug. Some patients with coronary heart disease simply increase the dosage of atorvastatin calcium, but the levels of total cholesterol (TC) and LDL-C do not significantly decrease. In addition, excessive dosage can affect liver function and cause adverse reactions such as muscle pain. For this reason, the medication regimen should be adjusted appropriately. Ezetimibe tablets are a new generation of powerful lipid-regulating drugs. The drug ingredients can specifically bind to the brush border receptors of small intestinal villi, block the absorption of cholesterol in the small intestine, prevent cholesterol from being transported to the liver through the small intestine, and then reduce the cholesterol level in the liver, induce the liver to synthesize LDL receptors, promote LDL metabolism, and significantly reduce blood cholesterol and LDL-C levels. The combined application of atorvastatin calcium and ezetimibe tablets can achieve the synergy of different lipid-lowering mechanisms, inhibit the absorption and synthesis of cholesterol at different targets, and gradually restore the blood lipid level of patients to the normal range, and its

curative effect is significantly better than that of single atorvastatin calcium treatment [7].

The results of this study showed that after treatment, the blood lipid indexes of the patients in the study group were better than those in the control group. Dyslipidemia is a high-risk factor in the onset and progression of coronary heart disease. Excessive levels of LDL-C can lead to aggravation of atherosclerosis, and excessive levels of TG can lead to increased mortality of patients. Therefore, appropriate lipid-lowering treatments should be adopted. Atorvastatin calcium is the basic medicine for preventing and treating coronary heart disease. After taking the medicine, it can block the synthesis of HMG-CoA in the liver, reduce the total amount of cholesterol synthesis, and then reduce the levels of lipoprotein and cholesterol in the blood. Atorvastatin calcium can also act on liver cells, induce the synthesis of LDL-C receptors on the cell surface, accelerate the metabolism of LDL-C, and then control the progression of atherosclerosis. Clinical studies suggest that cholesterol is excreted together with bile after metabolism in the human body, and part of the metabolized cholesterol can be absorbed by the small intestine. Treatment with atorvastatin calcium alone cannot inhibit cholesterol absorption. Some patients still have abnormal blood lipid levels after stopping the drug. For this reason, other lipid-lowering drugs need to be used to block the cholesterol absorption pathway. Ezetimibe tablets belong to a new generation of lipid-lowering drugs, which can bind to Niemann-Pick C1-like intracellular cholesterol transporter 1 (NPC1L1) in the epithelial tissue of the upper small intestine after medication to block the reabsorption of cholesterol in the small intestine, thereby reducing the cholesterol content in the liver and blood. The combined intervention of atorvastatin calcium and ezetimibe tablets can inhibit cholesterol synthesis and reabsorption through different channels, and then effectively regulate blood lipid levels, and its curative effect is significantly better than a single atorvastatin calcium treatment intervention [8]. The data of this study confirmed that the cardiac function and inflammatory factor levels of patients in the study group were improved after treatment. The reason for this result is that atorvastatin calcium has the effect of anti-infection and improving coronary vascular endothelial function, combined with ezetimibe treatment can effectively regulate blood lipid levels, control atherosclerotic plaque, reduce inflammatory response, repair damaged coronary vascular endothelial function, inhibit inflammatory response, and gradually improve cardiac function level [9]. The results of this study showed that the clinical effective rate of patients in the study group was higher than that in the control group. Lipid-lowering drugs are indispensable in drug treatment programs for patients with coronary heart disease. Simple atorvastatin calcium can only inhibit cholesterol synthesis, but cannot block the pathway of cholesterol reabsorption. Some patients have no significant improvement in blood lipid levels after taking the drug, and the lipid-lowering effect has not been significantly improved after increasing the dosage of the drug and may induce a variety of adverse reactions. Ezetimibe tablets can make up for the deficiency of atorvastatin calcium. After medication, it can bind to the relevant sites in the small intestine to block the absorption of cholesterol, which can help improve the lipid-lowering effect, so that patients can obtain satisfactory curative effects. The results of this study showed that there was no significant difference in the incidence of adverse reactions between the two groups. The main function of atorvastatin and ezetimibe tablets is lipid-lowering, the drug is absorbed and metabolized rapidly and has no accumulation in the human body, and there is no serious adverse reaction after the combined drug [10]. This study believes that the combined application of atorvastatin calcium and ezetimibe tablets in the treatment of patients with coronary heart disease can achieve good clinical effects, and this treatment plan has high clinical promotion value. In the process of drug treatment intervention, physicians need to conduct comprehensive and meticulous health management of patients, inform patients to pay attention to quitting smoking and alcohol in daily life, limit cholesterol intake, control primary diseases, guide patients to complete cardiac rehabilitation exercises, focus on improving patients' dietary problems, guide patients to maintain an optimistic state of mind, learn to self-control emotions, and guide patients to self-monitor the changes in their

condition. The treatment of coronary heart disease has long-term characteristics. For this reason, patients must strictly follow the doctor's prescription for medication. Doctors also need to dynamically evaluate the patient's condition and adjust the treatment plan early to speed up the patient's recovery process.

In summary, it can be seen that the clinical effect of atorvastatin calcium combined with ezetimibe tablets in the treatment of patients with coronary heart disease is significant, and it has the value of promotion and application. The number of samples of coronary heart disease patients included in this study is relatively small, and no comparative analysis of the same type of data has been carried out. The mechanism of atorvastatin calcium combined with ezetimibe tablets still needs to be analyzed and studied.

Disclosure statement

The author declares no conflicts of interest.

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