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Clinical Research on Musk Heart Drops for the Treatment of Ischemic Heart Failure (IHF) Complicated with Diabetes

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Abstract: Objective: To study the clinical effect of Musk Heart Drops in the treatment of ischemic heart failure (IHF) complicated with diabetes. Methods: 120 patients with IHF and diabetes admitted to Xiangshan First People's Hospital from May 2023 to May 2025 were selected as the research subjects. They were divided into a control group and an observation group, with 60 patients in each group, using a random number method. The control group received standard treatment, while the observation group received standard treatment plus Musk Heart Drops. The treatment lasted for 3 months. The treatment effects, symptom scores, 6-minute walk distance, cardiac function, serum indicators, and blood glucose indicators were compared and analyzed. Results: The observation group demonstrated a significantly higher treatment efficacy compared to the control group ($P < 0.05$). Post-treatment assessments revealed that the observation group had lower symptom scores, a longer 6-minute walking distance, and improved left ventricular function, as indicated by a higher left ventricular ejection fraction (LVEF) and reduced left ventricular end-systolic diameter (LVESD) and end-diastolic diameter (LVEDD) ($P < 0.05$). Additionally, plasma NT-proBNP levels were significantly lower in the observation group ($P < 0.05$). Metabolic parameters also improved, with the observation group showing lower fasting blood glucose (Glu) and glycated hemoglobin (HbA1c) levels than the control group ($P < 0.05$). Conclusion: Musk Heart Drops combined with standard treatment can control the condition of patients with IHF and diabetes, improve symptoms, 6-minute walk distance, cardiac function, NT-proBNP, and blood glucose levels, demonstrating significant application value.

Keywords: Ischemic heart failure complicated with diabetes; Standard treatment; Musk Heart Drops

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1. Introduction

With the increasing number of patients with diabetes and cardiovascular disease, the incidence of comorbidities such as ischemic heart failure (IHF) complicated with diabetes is also rising [1]. How to effectively treat IHF complicated with diabetes has become a key clinical research issue. Musk Heart Drops is a commonly used

Chinese medicine in cardiovascular medicine, originating from "Taiping Huimin Heji Ju Fang" Zhibaodan [2]. Based on clinical validation, Musk Heart Drops can play a significant role in the treatment of coronary heart disease and angina pectoris, which is conducive to improving heart function and relieving related symptoms. Some studies have pointed out that the main indication of Musk Heart Drops is coronary heart disease, but it can also achieve good benefits when used for the treatment of other types of cardiovascular diseases. Based on this, this study explored the therapeutic effect of Musk Heart Drops using 120 patients with IHF and diabetes as subjects.

2. Materials and methods

2.1. General information

From May 2023 to May 2025, 120 patients with IHF and diabetes admitted to Xiangshan First People's Hospital were selected as subjects. They were divided into two groups using a random number method, with 60 patients in each group. The sample size was estimated using the formula $n1 = n2 = 2[(u\alpha + u\beta) / (\delta/\sigma)] 2 + 0.25 u\alpha 2$, and after sample size estimation, it was found that the observation group and control group each required 50 samples. This study required a minimum sample size of 100 patients. Considering factors such as sample loss, dropout, and exclusion during the study period, the sample size was increased by 20% on the original basis, resulting in a final sample size of 120 patients. The general information of the two groups was collected and verified for comparability ($P > 0.05$). This study was approved by the medical ethics committee.

2.2. Diagnostic Criteria

Refer to the diagnostic criteria for IHF in the "Chinese Guidelines for the Diagnosis and Treatment of Heart Failure 2014" [3]; refer to the diagnostic criteria for diabetes in the "National Guidelines for the Prevention and Management of Diabetes at the Primary Level (2022)" [4].

2.3. Inclusion and exclusion criteria

Inclusion criteria: (1) Meet the diagnostic criteria for IHF and diabetes mentioned above, with NYHA functional classification of I–IV; (2) Age ≥ 30 years old; (3) No limitation on disease duration; (4) Informed of medication content, research content, and signed informed consent.

Exclusion criteria: (1) Do not meet the disease inclusion criteria; (2) Have participated in other studies or participated in disease-related studies within 1 month before the study; (3) Suffer from neurological diseases or mental illnesses; (4) Pregnant or lactating; (5) Peripheral vascular disease; (6) Allergic constitution; (7) Combined with severe arrhythmia, acute myocardial infarction, cardiogenic shock, pulmonary embolism, etc.; (8) Detected malignant tumors; (9) Detected liver and kidney dysfunction; (10) Detected communication barriers, consciousness barriers, intellectual disabilities.

2.4. Method

Both groups of patients received standardized Western medicine treatment, including the use of cardiotonic, diuretic, hypoglycemic, and antiplatelet drugs based on the severity of the disease and symptoms. During medication, patients' vital signs and disease indicators were monitored, adverse reactions were identified, and medication dosages were reasonably adjusted. The observation group was additionally treated with Musk Deer Heart Drops (Inner Mongolia Conba Pharmaceutical Co., Ltd. Shenglong Branch, National Medical Approval Number Z20080018, Specification: 35 mg * 18 pills), 2 pills once, 3 times a day, for 3 months.

2.5. Observation indicators

2.5.1. Clinical efficacy

Evaluate heart failure symptoms and cardiac function classification before and after treatment, and formulate a judgment based on actual changes [5]. Markedly effective: Symptoms are controlled, and cardiac function decreases by ≥ 2 grades; Effective: symptoms are relieved, and cardiac function decreases by 1 grade; Ineffective: no significant changes in symptoms and cardiac function, or the condition worsens; Treatment effectiveness rate = Markedly effective rate + Effective rate.

2.5.2. Symptom score

The main symptoms are chest tightness, shortness of breath, and palpitations, while the secondary symptoms are fatigue, cyanosis of lips and nails, lower extremity edema, and oliguria. The scoring system is 0 for absent, 1 for mild, 2 for moderate, and 3 for severe, with a total score ranging from 0 to 21. The lower the score, the less severe the symptoms.

2.5.3. 6-minute walk distance

Select a straight and unobstructed corridor in the department or a dedicated testing room as the venue, arrange patients to conduct the test, the nurse times, and the patient walks until the 6-minute timing is completed.

2.5.4. Cardiac function

Perform echocardiography before and after treatment to check left ventricular ejection fraction (LVEF), left ventricular end-systolic diameter (LVESD), and left ventricular end-diastolic diameter (LVEDD).

2.5.5. Serum indicators

Collect 3 mL of fasting venous blood samples to detect plasma amino-terminal pro-brain natriuretic peptide (NT-proBNP).

2.5.6. Blood glucose indicators

Collect 3 mL of fasting venous blood samples to test fasting blood glucose (Glu) and glycated hemoglobin (HbA1c).

2.6. Statistical methods

The statistical analysis was performed using SPSS 26.0. Categorical variables were presented as percentages (%) and analyzed with the chi-square (x^2) test. Normally distributed continuous data were reported as mean ± standard deviation (SD) and compared using the t-test or ANOVA (F-test). A p-value of less than 0.05 was considered statistically significant.

3. Results

3.1. Comparison of general information

The comparison of general information between the two groups is shown in **Table 1**.

Table 1. General information of two groups [n/(mean ± SD)]

Group	Cases	Male/Female (n)	Age (years)	BMI (kg/m²)
Study group	60	36/24	63.98 ± 6.52	25.43 ± 1.52
Control group	60	33/27	63.21 ± 6.35	25.18 ± 1.36
t/x^2 value	-	0.307	0.655	0.949
P value	-	0.580	0.514	0.344

3.2. Comparison of clinical efficacy

The comparison of clinical efficacy between the two groups is shown in **Table 2**.

Table 2. Clinical efficacy of the two groups (n/%)

Group	Cases	Markedly effective (n)	Effective (n)	Ineffective (n)	Effective rate (%)
Study group	60	38	21	1	98.33
Control group	60	26	27	7	88.33
t/x^2 value	-	-	-	-	4.821
P value	-	-	-	-	0.028

3.3. Comparison of symptom scores

The comparison of symptom scores between the two groups is shown in **Table 3**.

Table 3. Symptom scores of the two groups (mean ± SD, score)

Group	Cases	Before treatment	After 1 month	After 2 months	After 3 months
Study group	60	14.98 ± 1.78	11.04 ± 1.32	8.02 ± 1.17	5.43 ± 1.02
Control group	60	14.62 ± 1.65	12.54 ± 1.47	10.15 ± 1.32	7.45 ± 1.13
t value	-	1.149	5.881	9.354	10.279
P value	-	0.253	< 0.001	< 0.001	< 0.001

3.4. Comparison of 6-minute walking distance

The comparison of 6-minute walking distance between the two groups is shown in **Table 4**.

Table 4. 6-minute walking distance of the two groups (mean ± SD, m)

Group	Cases	Before treatment	After 1 month	After 2 months	After 3 months
Study group	60	228.31 ± 14.16	260.12 ± 16.75	295.65 ± 17.82	338.78 ± 18.71
Control group	60	230.67 ± 14.58	245.42 ± 16.42	270.46 ± 17.35	303.21 ± 18.46
t value	-	0.899	4.854	7.845	10.483
P value	-	0.370	< 0.001	< 0.001	< 0.001

3.5. Comparison of cardiac function and serum indicators

The comparison of cardiac function and serum indicators between the two groups is shown in **Table 5**.

Table 5. Cardiac function and serum indicators of the two groups (mean ± SD)

Group	Cases	LVEF (%)		LVESD (mm)		LVEDD (mm)		NT-proBNP (ng/L)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Study Group	60	34.10 ± 3.56	52.98 ± 4.71	52.87 ± 4.85	40.78 ± 4.01	63.87 ± 4.95	47.43 ± 4.12	1945.23 ± 356.76	703.12 ± 180.21
Control Group	60	34.75 ± 3.77	46.23 ± 4.35	52.21 ± 4.70	45.38 ± 4.35	63.12 ± 4.80	53.76 ± 4.35	1921.32 ± 352.18	998.23 ± 195.45
t value	-	0.971	8.155	0.757	6.023	0.843	8.184	0.369	8.598
P value	-	0.334	< 0.001	0.451	< 0.001	0.401	< 0.001	0.713	< 0.001

Note: Compared with the same group before treatment, $P < 0.05$.

3.6. Comparison of blood glucose indicators

The comparison of blood glucose indicators between the two groups is shown in **Table 6**.

Table 6. Blood glucose indicators of the two groups (mean ± SD)

Group	Cases	Glu (mmol/L)		HbA1c (%)	
		Before treatment	After treatment	Before treatment	After treatment
Study group	60	7.99 ± 1.37	5.65 ± 0.62	7.40 ± 1.05	5.32 ± 0.55
Control group	60	7.67 ± 1.30	6.11 ± 0.73	7.65 ± 1.19	5.89 ± 0.61
t value	-	1.312	3.720	1.220	5.376
P value	-	0.192	< 0.001	0.225	< 0.001

Note: Compared with the same group before treatment, $P < 0.05$.

4. Discussion

Heart failure is one of the major public health challenges globally, affecting over 37.7 million patients. With the increasing aging population, the burden of heart failure is expected to continue to rise in the coming years [6]. Studies [7] have indicated that ischemic heart disease is the main cause of heart failure, and ischemic heart failure (IHF) is a common type. Insulin resistance, a typical marker of metabolic disorder and systemic inflammation, has been proven to be significantly associated with atherosclerotic cardiovascular disease and can induce poor prognosis. Insulin resistance plays an important role in the occurrence and progression of IHF. High levels of insulin resistance can increase the risk of heart failure, regardless of whether patients have type 2 diabetes, which is the main reason for the increasing number of patients with IHF and diabetes. In the past, standard treatments for patients with IHF and diabetes were often implemented regarding relevant guidelines and consensuses. However, the disease is difficult to cure and prone to relapse. Although standard treatment can alleviate the condition, long-term medication has limited effects and is prone to problems such as drug resistance.

In recent years, Chinese proprietary medicines have been widely used in the treatment of cardiovascular diseases and have achieved good results [8]. Musk deer heart-dropping pills are composed of cow bezoar, salvia

miltiorrhiza, and musk, which have the effects of promoting blood circulation to relieve pain, warming yang, and benefiting the heart. They play a positive role in the recovery of cardiovascular diseases [9]. This study is a controlled trial where two different treatment regimens were used in the two groups. After treatment, all indicators in the observation group were better, suggesting that the combination of musk deer heart-dropping pills and standard treatment has more practical value. The reason is that IHF and diabetes are mostly induced by insufficient coronary blood supply, myocardial ischemia and hypoxia, and high insulin resistance. Musk deer heart-dropping pills have the effect of promoting blood circulation, which can reduce myocardial ischemia, restore coronary blood supply, improve heart function [10], indirectly reduce insulin resistance, and regulate blood glucose levels. Therefore, the combination of standard treatment has a prominent effect.

5. Conclusion

In summary, the combination of musk deer heart-dropping pills and standard treatment can improve the treatment effect of IHF and diabetes, improve clinical symptoms, motor function, heart function, NT-proBNP, and blood glucose.

Disclosure statement

The author declares no conflict of interest.

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