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Clinical Evaluation of External Application of Granulation-Promoting Jade and Red Paste in the Treatment of Diabetic Foot

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Abstract: The purpose of this study is to analyze the clinical effect of external application of Granulation-Promoting Jade and Red paste in the treatment of diabetic foot. This study was carried out in Pingdingshan Traditional Chinese Medicine Hospital from December 2023 to December 2024. A total of 80 patients were selected as research objects, all of whom were diagnosed diabetic foot patients. They were treated and divided into two groups based on different methods, the group names were "experimental group" and "control group". Patients in the control group were treated with Vaseline on the basis of external treatment, and patients in the experimental group were treated with Granulation-Promoting Jade and Red paste on the basis of external treatment, and the clinical effects of different treatment methods were compared and analyzed. The results showed that the effective rate in the experimental group was significantly higher (95.00%) compared to the control group (75.00%) ($P < 0.05$). Furthermore, the experimental group exhibited notably shorter wound healing time and granulation tissue growth time, indicating faster and better recovery ($P < 0.05$). Additionally, post-treatment Wagner grading revealed that the proportion of patients in advanced grades (4, 5, and 6) was significantly lower in the experimental group, whereas a higher proportion of patients achieved lower grades (0, 1, and 2), demonstrating improved clinical outcomes ($P < 0.05$). In conclusion, Granulation-Promoting Jade and Red Paste shows a significant therapeutic effect in treating diabetic foot, effectively promoting wound healing, improving clinical symptoms, and enhancing overall recovery.

Keywords: External application of Granulation-Promoting Jade and Red paste; Diabetic foot; Clinical effect

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1. Introduction

Diabetes is a highly prevalent clinical condition in China, and in recent years, its incidence has been steadily increasing due to various factors, including changes in people's living habits and dietary patterns [1]. In many cases, the early stages of diabetes present no obvious symptoms, leading to delayed diagnosis until the disease has progressed to a more severe state, often accompanied by complications. Among these complications, diabetic

foot is one of the most common and serious. Diabetic foot primarily refers to infections, ulcerations, and gangrene occurring at or below the ankle joint [2]. According to relevant clinical research, the incidence of diabetic foot among diabetes patients in China is relatively high, ranging from approximately 1.0% to 1.8%, with nearly half of these patients eventually requiring amputation [3]. Therefore, timely and effective treatment is crucial in clinical management to prevent severe outcomes. Based on this context, the present study selected patients from our hospital as research subjects to investigate the clinical efficacy of the external application of Granulation-Promoting Jade and Red Paste, conducting a comparative analysis of its specific therapeutic effects.

2. Data and methods

2.1. Data analysis

This study was conducted in our hospital from December 2023 to December 2024. A total of 80 patients were selected as research objects in this study, all of whom were diabetic foot patients, and were divided into two groups (experimental group and control group) according to different treatment methods, with 40 patients in each group. To judge the feasibility of this study, the general data of the two groups of patients were compared to analyze whether other variables were associated. In terms of age data, patients in the two groups were selected from 44 to 83 years old and 45 to 80 years old, with average values of (62.23 ± 5.45) years old and (62.55 ± 5.29) years old, respectively. In terms of gender data, the number of male and female patients in the two groups was 22, 18, 24, and 16, respectively. In terms of course data, the course of disease ranged from 8 to 23 years, with an average of (15.45 ± 3.23) years and (15.39 ± 3.77) years, respectively. Statistically, the general data of the two groups were similar, with no significant difference ($P > 0.05$). The results indicated that this study was established.

The inclusion criteria for this study were as follows: all patients were clinically diagnosed with diabetes; all patients had diabetic foot, meeting the diagnostic standards consistent with Wagner's classification; and both patients and their families were fully informed about the study process and provided voluntary consent to participate [4]. The exclusion criteria included patients with other severe comorbidities affecting major organs such as the heart, liver, or kidneys; patients with mental disorders or impaired consciousness; critically ill patients; and those with poor treatment compliance or who voluntarily withdrew from the study.

2.2. Methods

Both groups were given the usual treatment, the patients' blood sugar levels were controlled, and infection control was given. At the same time, the necrotic tissue of the patients was removed, and the fresh tissue was rinsed (whirlpool rinsing with 30ml syringe), and the wound was rinsed with 3% hydrogen peroxide, normal saline, and 12U insulin.

Patients in the control group received routine treatment combined with external application of Vaseline. In contrast, patients in the experimental group received routine treatment along with the external application of Granulation-Promoting Jade and Red Paste. During the application process, the paste was evenly spread on sterile gauze to a thickness of approximately 3 mm, which was then placed directly in contact with the wound, and secured with an external cotton pad. For patients with deep wounds, a gauze strip coated with Granulation-Promoting Jade and Red Paste was inserted into the wound, followed by sterile dressing to ensure proper fixation. Additionally, regular dressing changes and wound observations were carried out to monitor the healing progress.

2.3. Observation indicators

The effective rate of treatment was compared between the two groups, which was mainly judged according to the wound healing of patients. There were three indexes (significant, effective, and ineffective). Among them, significant mainly means that the symptoms of the patient have disappeared or have not been obvious, and the ulcer surface has basically healed with the healing degree being more than 80%. Effective means that the symptoms of patients are significantly improved and the healing degree of ulcer surface is more than 40% and less than 80%. Ineffective means that the patient's symptoms have no significant change, or even aggravated, and the healing effect of the ulcer surface is poor, below 40%. Total efficacy (significant rate + effective rate) was calculated [5].

The recovery time indexes of the two groups were compared, including wound healing time and granulation tissue growth time. The ratings of diabetic feet of the two groups after treatment were compared and evaluated according to Wagner standard, which included 6 grades: grade 0 was no open lesion, grade 1 was superficial ulcer, grade 2 was neurotic ulcer with secondary infection, grade 3 was accompanied by abscess with tissue destruction, grade 4 was local gangrene with bone destruction, and grade 5 was total gangrene [6].

2.4. Statistical methods

The data were statistically analyzed and the software SPSS20.0 $\bar{x}$ was applied to calculate the measurement data. The measurement data met the normal distribution and were expressed in accordance with (± s) and T-test was adopted. At the same time, statistics of counting data were included, expressed by n (%), and verified by Chi-square. When the result was expressed as $P < 0.05$, it indicated that there was statistical significance in the study comparison [7].

3. Results

3.1. Comparison of therapeutic efficacy

The effective rate of the two groups of patients was 95.00% and 75.00%, respectively, and the experimental group was the higher one. The data of the two groups were significantly different ($P < 0.05$), as shown in **Table 1** for details.

Table 1. Comparison of the treatment effective rate between the two groups

Group	Significant	Effective	Ineffective	Effective rate
Experimental group (n = 40)	26(65.00)	12(30.00)	2(5.00)	38(95.00)
Control group (n = 40)	15(37.50)	15(37.50)	10(25.00)	30(75.00)
t				6.275
P				0.012

3.2. Comparison of healing time indicators

Compared with the control group, the wound healing time and granulation tissue growth time of the experimental group were both shorter, and the recovery was better. There were significant differences in various data between the two groups ($P < 0.05$). For the specific comparison, see **Table 2.**

Table 2. Comparison of healing time indexes between the two groups (± s) $\bar{x}$

Group	Wound healing time (d)	Granulation tissue growth time (d)
Experimental group (n = 40)	15.23 ± 2.44	3.55 ± 0.51
Control group (n = 40)	20.23 ± 2.33	5.36 ± 0.48
t	9.373	16.345
P	0.000	0.000

3.3. Comparison of Wagner ratings after treatment

Among the Wagner ratings of patients in the two groups after treatment, the proportion of patients in grade 4, 5 and 6 was significantly different ($P < 0.05$), among which the proportion of patients in the experimental group was significantly lower than that in the control group and the recovery of patients was better, with more patients in grade 0, 1 and 2, as shown in **Table 3**.

Table 3. Comparison of Wagner ratings between the two groups [n (%)]

Group	Grade 0	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Experimental group (n = 40)	10(25.00)	12(30.00)	9(22.50)	5(12.50)	3(7.50)	1(2.50)	0(0.00)
Control group (n = 40)	5(12.50)	5(12.50)	4(10.00)	6(15.00)	10(25.00)	6(15.00)	4(10.00)
X^2	2.051	3.660	2.296	0.105	4.510	3.914	4.211
P	0.152	0.056	0.130	0.745	0.034	0.048	0.040

4. Discussion

Diabetic foot is one of the common complications of diabetes. This disease is serious and poses a great threat to the health of patients [8]. From the actual clinical development, the occurrence of diabetic foot is mainly related to the long-term poor control of blood sugar, neuropathy, and blood circulation disorders caused by diabetes. After the onset of diabetic foot patients, the clinical manifestations usually include skin ulcer, infection, local tissue necrosis, etc., which can lead to amputation in severe cases, greatly affecting the quality of life of patients [9]. On this basis, giving patients active and effective treatment is an important part of clinical work. At present, the common clinical methods include controlling blood sugar, improving local blood circulation, preventing and treating infection, and promoting wound healing and other comprehensive treatment measures. Therefore, the early recognition and treatment of diabetic foot is very important [10].

After the application of Granulation-Promoting Jade and Red paste in this study, the results showed that the treatment efficiency of patients in the experimental group was higher and the recovery time of patients was shorter. After treatment, more patients scored medium and low Wagner rating, indicating that the effect was better. All the data were significantly different from that of the control group, expressed as $P < 0.05$. The results indicated that the application of Granulation-Promoting Jade and Red paste had a significant positive significance on the recovery of diabetic foot patients [11–13]. From the specific analysis, the application of Granulation-Promoting Jade and Red paste can effectively improve the speed of wound healing and reduce the occurrence of complications, especially in the case of diabetes patients whose blood sugar is not easy to control. Topical drugs can provide additional support for patients and promote their recovery [14]. At the same time, Granulation-Promoting Jade and Red paste

can promote local blood circulation, help patients repair vascular damage, further improve foot microcirculation, and reduce the occurrence of secondary lesions [15]. This not only helps to improve the quality of life of patients but also can reduce the burden of treatment and reduce medical costs, which is of significant significance.

In summary, Granulation-Promoting Jade and Red paste external application in the treatment of diabetic foot patients has positive significance, can improve the clinical treatment effect, improve the adverse symptoms of patients, promote the recovery of patients, high clinical value, can strengthen the use of drugs in the future development, and provide basic guarantee for the treatment and recovery of diabetic patients.

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Disclosure statement

The authors declare no conflict of interest.

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