Effect of Ma Yinglong Shexiang hemorrhoids cream combined with pearl powder on the pain and complications of severe pressure ulcer patients

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Abstract

Objective: The aim of this study was to investigate the effect of Ma Yinglong Shexiang Hemorrhoids Cream combined with pearl powder on pain and complications in patients with severe pressure ulcers.

Methods: One hundred seventeen patients with severe pressure ulcers hospitalized and treated in our hospital (January 2019–December 2019) were divided into Ma Yinglong Musk Hemorrhoid Cream Group (MY Group), Pearl Powder Group (PP Group), and combination with Ma Yinglong Musk Hemorrhoid Cream and Pearl Powder Group (MP group), 39 patients in each group. There was no significant difference in the general data of patients in MY group, PP group, and MP group. By analyzing the differences in clinical efficacy, secondary effects, scar incidence, pain, and clinical indicators of patients in the MY group, PP group, and MP group, the effects of Mayinglong Shexiang Hemorrhoid Cream combined with pearl powder in the treatment of pain and complications in patients with severe pressure ulcers were explored.

Results: After treatment, compared with the MY group and the PP group, the MP group had a higher clinical efficacy than the MY group and the PP group. Compared with MY group and PP group, the healing time, dressing change times, and dressing change time of MP group were better than MY group (P < .05). After treatment, the VAS score and incidence of secondary effects of the MP group was significantly lower than that of the MY group and PP group (P < .05). The incidence and area of scar formation in the MP group were lower than those in the MY group and the PP group (P < .05).

Conclusion: Compared with Ma Yinglong Musk Hemorrhoid Cream or Pearl Powder, combination of Ma Yinglong Musk Hemorrhoid Cream and Pearl Powder are more effective in treating severe pressure ulcer patients, and can significantly reduce the pain in the affected area and reduce the occurrence of complications.

Abbreviations: MP group = Ma Yinglong Musk hemorrhoid cream combined with pearl powder group, MY group = Ma Yinglong Musk hemorrhoid cream group, PP group = pearl powder group, VAS = Visual analogue scale

Keywords: complications, Ma Yinglong musk hemorrhoid cream, pain, pearl powder, severe pressure sores

1. Introduction

Pressure ulcer is a disease in which the local tissues of patients are under long-term pressure, which affects the blood circulation and causes pathological changes at the cortex. People who are bedridden for a long time are prone to suffer from pressure ulcers, resulting from compressing local tissues for a long time, failing to provide timely nutrition, and leading to soft tissue necrosis.[1,4] Pressure ulcers are clinically divided into 4 stages: redness, infiltration, shallow ulcer, and deep ulcer.[3] The clinical features of ulcerative pressure ulcers can be divided into 2 types. The less severe cases have tissue infection and pus, but the more severe cases have smelly, black, and highly invasive ulcer sites, which expand outward and even cause septicemia.[4] According to the research, the occurrence of pressure ulcers is caused by a variety of factors. According to the data, up to 60,000 patients die of severe pressure ulcers every year worldwide. Therefore, it is very important to control the infection of patients with pressure ulcers.[5] At present, clinical treatment for pressure ulcer patients should not only relieve their pressure, but also complete debridement and relevant surgical treatment should be carried out for patients. Its proposition is to keep the moisture of ulcer wound, which is conducive to the improvement of ulcer site.[4] Musk hemorrhoids ointment is a pure Chinese medicine preparation, with the function of promoting blood circulation and removing blood stasis, removing decay muscle, and is beneficial to tissue regeneration and wound healing. Therefore, it can be used to treat pressure ulcers in clinical practice, with obvious effect.[7] Pearl powder is a kind of powdery substance made of pearl ground by bivalve animals, such as pearl oysters,
pearl oysters, mussels of mussels family, etc, stimulated by the outside world. As a kind of precious Chinese herbal medicine, pearl has a history of more than 2000 years in China. It is sweet, salty, cold, soothing to the heart and the liver meridian, and has the functions of calming the mind, clearing the eyes, and detoxifying the muscles. Pearl powder has certain effect on delaying skin aging, and is often used in whitening, skin care, and other fields in clinical practice. In recent years, some scholars have studied the treatment of burns, pressure sores, and other diseases with pearl powder, but the results are few. Therefore, this paper analyzed the differences in clinical efficacy, secondary effect, scar incidence, clinical indicators, and pain between MY group and MP group to explore the effects of Musk hemorrhoids cream combined with pearl powder on pain and complications in patients with severe pressure ulcers.

2. Materials and methods

2.1. Patients

According to different treatment methods, 117 patients with severe pressure ulcers hospitalized in our hospital from January 2019 to December 2019 were divided into Ma Yinglong Musk hemorrhoid cream group (MY group), pearl powder group (PP group), and Ma Yinglong Musk hemorrhoid cream combined with pearl powder group (MP group) (n = 39 in each group). The general data of the 3 groups were comparable (Table 1, P > .05). All patients signed informed consent. The study was approved by the Medical Ethics Committee Traditional Chinese Medical Hospital of Xinjiang Uygur Autonomous Region.

Inclusion criteria included that all patients were patients with severe pressure ulcer, all patients know and agree with this experiment, and the compression wounds of all patients presented persistent ulcerative pathological changes, with the degree of ulcer reaching grade 2 or above.

Exclusion criteria included patients with incomplete data collection and patients with other organ diseases.

2.2. Treatment

Patients in MY group were routinely cleaned the ulcer surface, and the floss of the wound surface and necrotic purulent secretions were removed to reveal the fresh ulcer wound. Then, Ma Yinglong Shexiang hemorrhoid ointment was adjusted into paste and applied on the wound, with a thickness of about 1 mm and a range of 0.5 cm over the edge of pressure ulcer. Sterile protective film for the surgical incision was pasted from the damaged center to the surrounding area to ensure that no air was left under the film, and the surrounding area was 2 cm over the wound to prevent the wound from communicating with the outside. Change the dressing once a day.

After local debridement and disinfection of pressure ulcers in PP group, pearl powder was lightly applied to the affected area using sterile cotton swab, 3 to times a day. For patients with blisters, the water in blisters were pumped with a syringe after routine disinfection, cleaned with normal saline, and then applied with pearl powder. For patients with severe pressure sore infection and excessive exudation, necrotic tissue must be removed from wound and then washed with normal saline for 2 ~ 3 times. Then, pearl powder was applied to wound 3 ~ 4 times daily.

For patients in MP group, the treatment methods were the same as those in the MY group and the PP group. The drug was replaced with Musk hemorrhoid ointment and mixed with pearl powder for application. All the patients in three groups received 2 courses of treatment, with 14 days as 1 course. The ratio of pearl powder and Ma Yinglong Shexiang Hemorrhoids Cream was 1:1.

2.3. Clinical therapeutic effects

The clinical therapeutic effect for all patients was divided into cure, obvious effect, effectiveness, and invalid. Cure referred to no ulcer and all epithelial tissue crawling. Obvious effect referred that the local surface of the ulcer had been basically healed, and the wound face was dry without infiltration. Effectiveness referred that the infection of wound was controlled, exudation lessened, swelling disappeared, and fresh granulation tissue

| Table 1  | General data (n/× ±s). |
|----------|-----------------------|
| Items    | MY group (n = 39)     | PP group (n = 39)     | MP group (n = 39)     | X²/F  | P     |
| Gender   |                       |                       |                       |       |       |
| Male     | 25                    | 16                    | 20                    | 2.000 | .367  |
| Female   | 14                    | 23                    | 19                    | 1.000 | .606  |
| Sites of ulcer |                 |                       |                       |       |       |
| Chest    | 8                     | 10                    | 6                     | 0.350 | .839  |
| Back     | 10                    | 17                    | 14                    |       |       |
| Hips     | 11                    | 10                    | 11                    |       |       |
| Others   | 10                    | 12                    | 8                     |       |       |
| Underlying disease |             |                       |                       |       |       |
| Diabetes | 13                    | 12                    | 15                    |       |       |
| Hypertension | 15           | 13                    | 11                    |       |       |
| Others   | 11                    | 14                    | 13                    |       |       |
| Area of ulcer, cm² | 13.81 ± 2.45 | 12.16 ± 2.31 | 12.93 ± 2.11 | 1.700 | .093  |
| Time of wound formation, d | 24.87 ± 8.71 | 24.49 ± 7.49 | 25.13 ± 7.52 | 0.141 | .888  |
| Number of wounds | 21.45 ± 4.24 | 21.37 ± 3.97 | 22.64 ± 3.95 | 1.261 | .211  |
| Age, yr  | 35.26 ± 6.28          | 35.13 ± 5.18          | 36.28 ± 5.37          | 0.771 | .443  |
| Course of disease, yr | 3.56 ± 0.18 | 3.52 ± 0.15 | 3.54 ± 0.12 | 0.577 | .565  |
invalid referred that wound diameter did not decrease, with enlarged ulcer, heavily oozing and severe redness and swelling. Total effectiveness = cure + obvious effect + effectiveness/number of people \times 100%.

2.4. Clinical index
Clinical index, including the number and time of dressing change of patient, and the healing time of ulcer surface in patients in MY group, PP group, and MP group, was observed within 28 days from the beginning of the treatment to the end of 2 courses.

2.5. Pain
Visual analogue scale (VAS) score was used to measure the pain. The higher the score was, the more intense the pain was, with a total score of 10.

2.6. Occurrence of scar
After the end of treatment, patients in all groups were followed up for 6 months, and the incidence and area of scars were recorded.

2.7. Occurrence of complications
After treatment, the secondary effects of the patients were recorded and analyzed, including wound infection, wound hematoma, wound effusion, etc.

2.8. Statistical analysis
The data was analyzed by SPSS23.00. The count data were showed by n (%) and the comparison in group was performed by Chi-square. The measurement data were showed by (x ± s). The comparison between groups was conducted by independent t test and the comparison between different time points was conducted by repeated measures analysis of variance. And P < .05 indicated a significant difference.

3. Results

3.1. The MP group showed better clinical efficacy
After treatment, 33 patients in MY group showed certain therapeutic effect, among which 8 patients were cured. A total of 31 patients in PP group had certain therapeutic effect, among which 7 patients had recovered. A total of 37 patients in the MP group showed good treatment effect, among which 15 patients recovered. Compared with MY group and PP group, the clinical effective efficacy of MP group was higher than that of MY group and PP group, but there was no significant difference between among the groups (P > .05) (Table 2).

3.2. Patients in MP group showed shorter healing time and dressing change time and less dressing change times
The healing time and dressing change time of the MP group were shorter than those of the MY group and PP group (P < .05). The dressing change times for the patients in MP group were less than those of the MY group and PP group (P < .05). However, there was no significant difference for healing time, dressing change times, and dressing change time between MY group and PP group (P > .05) (Table 3).

3.3. Patients in MY group were more effective in relieving pain after treatment
Before treatment, there was no significant difference in pain scores among the 3 groups (P > .05). After treatment, VAS score of MP group was significantly lower than that of MY group and PP group (P < .05). There was no significant difference in VAS score between MY group and PP group after treatment (P > .05) (Table 4).

3.4. Patients in the MP group had less scar formation after treatment
After treatment, the incidence and area of scar formation were lower in MP group than that in MY group and PP group.
and there was no significant difference in scar formation between the MY group and PP group ($P > .05$) (Table 5).

### 3.5. The incidence of secondary effects was lower in the MP group

After treatment, secondary effects were observed in a total of 4, 3, and 6 patients in MY, MP, and PP groups, respectively. The number and incidence of secondary effects in MP group were lower than that in MY group and PP group ($P > .05$), and there was no significant difference between the MY group and PP group ($P > .05$) (Table 6).

### 3.6. Typical case analysis

Male, 53 years old, developed pressure ulcers due to long time in bed. The patient was treated with Ma Yinglong Musk Hemorrhoid Cream combined with pearl powder and showed obvious clinical effect (Fig. 1).

### 4. Discussion

Pressure ulcer, a kind of skin rupture caused by pressure that cannot be released, resulting in subcutaneous tissue necrosis, is a disease prone to lower extremity sacrum and ischial nodule. Pressure ulcer is difficult to treat and recurrent formation of ulcers would lead to the development of unhealthy granulation, and induce skin strophic lesions. Studies have shown that diabetics who are beaded for a long time and have diabetes are prone to this disease, and should be treated in time when mild ulcers occur; otherwise, necrotic ulcers will be directly caused by mild ulcers, which will affect the lives of patients. Sterilization is one of the commonly used methods for the treatment of ulcerative pressure sores, which can prevent the grow of bacteria, but it also weakens the healing rate and prolongs the disease.

In a humid environment, epithelial tissue cells will express actively to promote the growth of granulation tissue, which recommend that the treatment of pressure ulcers patients is best done in a moist environment for the wound.[11] Mayinglong Musk Hemorrhoid cream contains a variety of Chinese medicine ingredients, including: artificial bezoar, borneol, Vaseline, and so on, among which borneol can play a role of reducing swelling, analgesia, heat, artificial bezoar can resist inflammation, clear heat and detoxify, vaseline can better protect the skin of patients, and calamine can remove saprophytic muscle and has good bactericidal, astringent, and hemostatic effects.[12,13] In recent years, it has been found that pearl contains a variety of amino acids, biological calcium, and trace elements, which are also the main effective components of its pharmacological effects. However, the active components, pharmacological effects, and clinical efficacy of pearl deserve further systematic research. This study found that after treatment, the clinical effective efficacy of
MP group was higher than that of MY group and PP group, but there was no significant difference between MY group and PP group. The clinical indicators of the MP group were all better than those of the MY group and PP group, and there was no significant difference in the clinical indicators of the MY group and PP group. Before treatment, there was no significant difference of pain scores among the 3 groups. After treatment, VAS score of MY group was significantly higher than that of MP group and PP group, while there was no significant difference between MY group and PP group. After treatment, the incidence and area of scar formation in MP group were both lower than those in MY group and PP group, and there was no significant difference in scar formation between MY group and PP group (P > .05). The number and incidence of secondary effects in the MP group were slightly lower than that in the MY group and PP group, while the secondary effects between the MY group and PP group were not significantly different. Ma Yinglong Shexiang Hemorrhoids Cream can effectively clean the ulcer wound surface of pressure ulcer patients and accelerate wound healing, because Ma Yinglong Shexiang Hemorrhoids Cream is a pure Chinese medicine preparation, with no irritation, high fusion with the skin, which will not adhere to the wound, and is safe without side effects. [14,15] When Ma Yinglong Shexiang Hemorrhoids Cream is mixed into paste, the exudate of the wound can be transformed into gel, creating favorable conditions for the healing of ulcer surface. Then, the ulcer site can be improved rapidly, granulation can grow healthy, epithelial tissue can crawl faster, and the healing area can be greatly increased. [16,17] Studies have shown that Ma Yinglong Shexiang Hemorrhoids Cream has a strong antibacterial effect, which can effectively inhibit the growth and reproduction of bacteria and has the effect of removing humus and generating muscle. The application of pearl powder in the treatment of pressure ulcer patients can promote cell proliferation and differentiation, enhance blood circulation function, make the relevant granulation tissue grow better, promote wound healing, and play an effective role of myogenesis and detoxification. [18] Calcium carbonate and amino acid components in pearl powder can participate in the process of blood coagulation. If pearl powder is directly covered in the lesions of patients, it can promote the precipitation of fibrin, shorten the time of blood coagulation and accelerate the speed of division and reproduction. Pearl powder can be dissolved with tissue fluid to promote wound healing. [19] Pearl powder contains essential amino acids and other ingredients, which can regulate the function of the central nervous system and provide nerve nutrition, promote the metabolism of skin, supply skin nutrition, and facilitate tissue regeneration. Studies have shown that pearl powder contains sodium, zinc, and calcium elements, which will cause local hypertonic environment after being applied to the wound surface, leading to the dehydration and die of the bacteria. Zinc is a constituent of many important enzymes, and its involvement in tissue healing can accelerate tissue repair. Calcium can reduce the permeability of capillary wall and reduce the formation of exudate, which is conducive to the growth of fresh granulation. As pearl powder is a powder, it can prevent skin rubbing, absorb moisture and make the skin smooth, avoid physical irritation of the skin, and preventing inflammation, which would give a fresh and comfortable feeling for patients. Combined experiments show that Ma Yinglong Shexiang Hemorrhoids Cream combined with pearl powder can significantly inhibit the incidence of infection, reduce the pain of patients with pressure ulcers, promote wound healing, reduce the healing time and the frequency of dressing, save costs, increase curative effect, and reduce the incidence of scar after treatment. [20]

However, there are also some limitations in this study. First, the sample size is small. The further studies can evaluate the efficacy by expanding the sample size. In addition, we did not rule out the effect of other factors, such as age, which may lead to different healing time. Moreover, the ratio of pearl powder and Ma Yinglong Shexiang Hemorrhoids Cream was 1:1. Further study could be performed to explore different ratio.

In summary, compared with the single musk hemorrhoid ointment, the combination of pearl powder and Ma Yinglong Shexiang Hemorrhoids Cream has a better therapeutic effect on patients with severe pressure ulcers, shorten treatment time, and dressing change times, which can significantly reduce the pain in the affected areas and reduce the incidence of complications.

Author contributions

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Investigation: Dongling Niu.
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Figure 1. Typical case analysis. (A—E) referred to the ulcer wound before treatment, the first week of treatment, the second week of Treatment, the third week of treatment, and the 4th week of treatment.
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