Effect of lipidmicrosphere prostaglandin combined with Shengji plaster on bedsore healing in III and IV degree
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Objective: To observe the effect of lipidmicrosphere prostaglandin (Lipo PGE1) combined with Shengji plaster on the bedsore healing. Methods: A total of 100 patients with bedsores in III and IV degree who were admitted in our hospital from January, 2013 to January, 2015 were included in the study and divided into the observation group and the control group with 50 cases in each group according to different treatment protocols. The blood glucose, infection, and blood pressure in the two groups were effectively controlled. The patients in the observation group were given intravenous drip of Lipo PGE1, and external application of Shengji plaster, while the patients in the control group were given intravenous drip of Chuanxiongqin injection and external application of Shengji plaster. Four-week treatment was regarded as one course. The specimens on the wound surface of bedsores 1, 2, 3, and 4 weeks after treatment were collected. SABC developing method was used to observe the blood capillary density value (/10 HP). TcPO₂ 1 cm around the wound surface and the skin temperature were measured. Results: The blood capillary density values 1, 2, 3, and 4 weeks after treatment were significantly higher than those in the control group (P<0.05). The bedsore wound surface skin temperature 2, 4, 6, and 8 h after medication in the observation group was significantly lower than that in the control group (P<0.05), while TcPO₂ was significantly higher than that in the control group (P<0.05). Conclusions: Lipo PGE combined with Shengji plaster can effectively improve the blood circulation on the wound surface of bedsores, and promote the bedsore healing.

1. Introduction

Bedsore is also called pressure sore or pressure ulcer, mostly occurring in patients with long-term immobilization, and is mainly caused by long-term pressure of local tissues, resulting in persistent ischemia and hypoxia, and tissue pester and necrosis[1]. Bedsore is mainly occurring in bone bungle which is often pressed with no muscle being wrapped, or thin muscle layer, and lack of fat tissue protection[2,3]. According to the statistics[4], every year about 60 000 people die of bedsore which is a difficult tissue during the rehabilitation treatment and nursing. Currently, the traditional Chinese medicine is mainly involved in the treatment of bedsores to promote the decay removing and skin growing of the wound surface[5]. Some scholars argue that[6,7] purely aiming at promoting the local wound surface healing is not enough, but laying an emphasis on improving the blood circulation around the wound surface is crucial. The study is aimed to observe the effect of lipidmicrosphere prostaglandin (Lipo PGE1) combined with Shengji plaster on the bedsore healing.

2. Materials and methods

2.1. Clinical data
A total of 100 patients with bedsores in III and IV degree who were admitted in our hospital from January, 2013 to January, 2015 were included in the study, among which 68 were male, and 32 were female; aged from 50 to 79 years old, with an average age of (56.2±10.9) years old; 52 had coma in cerebrovascular events, and 48 had high paraplegia; 56 at grade III, and 44 at grade IV according to NPUAP; with no bone exposure; 56 in the sacrococcygeal region, 21 in the scapular region, and 20 in the perineal region; 34 had bedsores area ≤6 cm², and 66 between 6-12 cm².

2.2. Methods

The patients were divided into the observation group and the control group with 50 cases in each group according to different treatment protocols. The patients in the two groups were given routine local treatments. On this basis, the patients in the observation group were given Lipo PGE₁ (produced by Beijing Taide Pharmaceutical Co. Ltd, 20 μg) + 0.9% NaCl (250 mL), iv drip, qd, and Shengji plaster, qd. Shengji plaster was mainly consisting of Angelica sinensis, Shengxueyu, Radix rehmanniae, turtle shell, plaster stone, and calamine, with main efficacies of flesh regeneration, sores removing, and blood stopping, and is prepared with drug/plaster in a ratio of 100:8. The patients in the control group were given ligustrazine hydrochloride injection (produced by Tianjing Jinyao Amino Acid Pharmaceutical Co. Ltd, Approval No. H12020888, 10 mL) + 0.9% NaCl (250 mL), iv drip, bid, and Shengji plaster, qd. Four-week treatment was regarded as one course.

2.3. Observation indicators

The specimens on the wound surface of bedsores 1, 2, 3, and 4 weeks after treatment were collected. SABC developing method was used to observe the blood capillary density value (/10 HP). TcPO₂ 1 cm around the wound surface and the skin temperature were measured. The thermometer was placed 20 cm from the center of wound surface for 10 s, continuously for 3 times, and the average value was taken.

2.4. Statistical analysis

SPSS 12.0 software was used for the statistical analysis. The measurement data were expressed as mean±SD, and the paired t test was used. P<0.05 was regarded as statistically significant difference.

3. Results

3.1. Comparison of blood capillary density value on wound surface at each timing point between two groups

With the extending of treatment time, the blood capillary density value was significantly increased, and the blood capillary density values 1, 2, 3, and 4 weeks after treatment in the observation group were significantly greater than those in the control group (P<0.05) (Table 1).

Table 1
Comparison of blood capillary density value on wound surface at each timing point between two groups (/10 HP).

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>1 week</th>
<th>2 weeks</th>
<th>3 weeks</th>
<th>4 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation group</td>
<td>50</td>
<td>37.78±12.19</td>
<td>44.99±16.44</td>
<td>53.56±8.23</td>
<td>57.45±12.01</td>
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<tr>
<td>Control group</td>
<td>50</td>
<td>21.77±9.33</td>
<td>26.14±6.01</td>
<td>34.52±8.94</td>
<td>35.64±8.59</td>
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<tr>
<td>t</td>
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<td>3.92</td>
<td></td>
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<tr>
<td>P</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
<td></td>
</tr>
</tbody>
</table>

3.2. Comparison of wound surface skin temperature at each timing point between two groups

The bedsore wound surface skin temperature 2, 4, 6, and 8 h after medication in the observation group was significantly lower than that in the control group (P<0.05) (Table 2).

Table 2
Comparison of wound surface skin temperature at each timing point between two groups (℃).

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>2 h</th>
<th>4 h</th>
<th>6 h</th>
<th>8 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation group</td>
<td>50</td>
<td>33.8±1.8</td>
<td>33.9±1.6</td>
<td>33.8±0.1</td>
<td>34.0±0.2</td>
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<tr>
<td>Control group</td>
<td>50</td>
<td>34.7±0.4</td>
<td>34.9±0.4</td>
<td>34.8±0.2</td>
<td>34.9±0.3</td>
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<tr>
<td>t</td>
<td>1.62</td>
<td>0.99</td>
<td>1.41</td>
<td>1.39</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
<td></td>
</tr>
</tbody>
</table>

3.3. Comparison of TcPO2 at each timing point between two groups

TcPO₂ 2, 4, 6, and 8 h after medication in the observation group was significantly higher than that in the control group (P<0.05) (Table 3).

Table 3
Comparison of TcPO₂ at each timing point between two groups (mmHg).

<table>
<thead>
<tr>
<th>Groups</th>
<th>n</th>
<th>2 h</th>
<th>4 h</th>
<th>6 h</th>
<th>8 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation group</td>
<td>50</td>
<td>43.1±23.2</td>
<td>44.2±18.5</td>
<td>43.2±15.7</td>
<td>43.4±9.0</td>
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<tr>
<td>Control group</td>
<td>50</td>
<td>42.1±8.2</td>
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<td>42.3±6.5</td>
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<tr>
<td>t</td>
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<td>1.44</td>
<td>1.06</td>
<td>1.12</td>
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<tr>
<td>P</td>
<td>&lt;0.05</td>
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4. Discussion

Bedsore, mostly occurring in patients with paraplegia, multiple injuries, cerebral trauma, cerebrovascular events, activity difficulty, and circulation blocking, is mainly caused by long-term local pressure, resulting in local tissue ischemia, hypoxia, and malnutrition which can induce tissue fester and necrosis[8]. Patients with bedsores mostly have a poor general condition, and long medical history. Bedsores in III and IV degree can cause ulcer and bacterial infection, and in a severe condition can induce septicemia and septicopyemia, which can endanger the patients’ life; therefore, the treatment is a
Some scholars argue that pure treatment for bedsores can not obtain a satisfactory efficacy; therefore, different treatment protocols should be adopted to resolve different tissues and improve the local microcirculation of pressed tissues, and in combination with comprehensive treatment to achieve a twice effect. Shengji plaster was mainly consisting of Angelica sinensis, Shengxueyu, Radix rehmanniae, turtle shell, plaster stone, and calamine, with main efficacies of flesh regeneration, sores removing, and blood stopping, and is widely applied in the large area soft tissue defect or infectious open fracture in the clinic. The granulation tissues are growing rapidly after application of Shengji plaster which can significantly promote the wound surface healing[12,13]. Lipo PGE$_1$ is a carrier of new type lipid microsphere drugs, has specific affinity, can inhibit TXAZ synthesis and the formation of immune complex, alleviate the microvascular spasm, and significantly improve the microcirculation, and increase the erythrocyte deformation ability[14-16]. Shengji plaster is directly applied on the wound surface in the study to promote the local microcirculation and tissue growth in order to facilitate the wound surface recovery, and in combination with Lipo PGE$_1$ can improve the local microcirculation of wound surface, promote the tissue growth speed, and enhance the therapeutic effect.

The results in the study showed that the blood capillary density values 1, 2, 3, and 4 weeks after treatment in the observation group were significantly greater than those in the control group ($P<0.05$); the bed sore wound surface skin temperature 2, 4, 6, and 8 h after medication in the observation group was significantly lower than that in the control group ($P<0.05$), while TcPO$_2$ was significantly higher than that in the control group ($P<0.05$), indicating that Lipo PGE$_1$ combined with Shengji plaster can effectively improve the local tissue microcirculation on the wound surface, increase the blood capillary density, and promote the bed sore healing.

In conclusion, Lipo PGE$_1$ combined with Shengji plaster can effectively improve the blood circulation on the wound surface of bedsores, and promote the bed sore healing.

References


