A NEW AMORPHOUS HYDROCOLLOID FOR THE TREATMENT OF PRESSURE SORES: A RANDOMISED CONTROLLED STUDY

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Abstract. A randomised controlled study was carried out to compare the effect of a new amorphous hydrocolloid (hydrogel, Coloplast) with that of conventional treatment on the healing time of pressure sores. After initial debridement in the outpatient clinic of pressure sores located in the sacral \( n = 21 \) or trochanteric \( n = 11 \) area the patients were randomised to be treated with either hydrogel \( n = 17 \) or wet saline compresses \( n = 15 \). Once a week the healing was estimated by the same investigator. The relative volumes (from the initial 100%) of hydrogel-treated wounds were significantly less \( (26 \pm 20\%, p < 0.02) \) than those of saline treated wounds \( (64 \pm 16\%) \) in the last week of the study. The saline treated wounds needed more frequent weekly debridement than the hydrogel-treated wounds \( (21\% \text{ compared with } 7\% \text{ of all weekly dressings, } p < 0.05) \). We conclude that amorphous hydrocolloid increases current healing of pressure sores compared with conventional treatment. It is therefore a better choice for treating patients with pressure sores in their homes.

Key words: hydrogel, pressure sore, healing.

Hydrocolloids, which consist of hydrated hydrophilic polymers, produce a moist environment that improves wound healing (2). Applied as a sheet they reduce the healing time of pressure sores compared with conventional dressings (1). Applied in an amorphous form they are also effective in accelerating healing, probably by their debriding effect (5).

Pressure sores often develop in immobile elderly patients with acute diseases and persist for some time after the illness has been cured. Continuous debridement and removal of necrotic tissue to avoid infection is an important factor in healing of such sores. There is therefore a need for a simple treatment of pressure sores so that the patients can be treated at home with no need for surgical intervention.

The purpose of this study was to compare the effect of a newly developed amorphous hydrocolloid with that of conventional treatment on wound debridement and healing of pressure sores.

PATIENTS AND METHODS

After informed consent had been obtained, 32 consecutive patients were included in the study, which was approved by the ethics committee of Copenhagen. We included patients with stage 3 or 4 (4) non-infected pressure sores located in the sacral \( (n = 21) \) or trochanteric \( (n = 11) \) areas. Patients with diseases or taking drugs known to impair healing were excluded. After initial surgical debridement in the outpatient clinic all patients were randomised to be treated with either saline gauze compresses \( (n = 15) \) or hydrocolloid (hydrogel, Coloplast A/S, Denmark) \( (n = 17) \). All sores were dressed with Comfeel Transparent Dressing (Coloplast A/S, Denmark). All sores were cleaned and changed daily. Once a week the healing of the sores was estimated by measuring the amount of water needed to fill the cavity. The need for debridement was evaluated, and done as necessary. The patients were followed for 12 weeks or until the ulcer had healed in their home environment. The data were skewed and therefore assessed by the non-parametric Mann-Whitney test. Differences were accepted as significant if the probability was less than 0.05.

RESULTS

Characteristics of the two groups are shown in Table I. During the 12 week period of the study nine patients in the hydrogel group withdrew...
because of other illness \((n = 5)\), death \((n = 2)\), missing schedule \((n = 1)\), and a wish to cease participating in the trial \((n = 1)\). In the control group 11 withdrew because of insufficient effect of treatment \((n = 6)\), other illness \((n = 3)\), death \((n = 1)\), and a wish to cease participation \((n = 1)\).

The data of all the patients are included in the results and evaluated in the last week of treatment. The relative volumes (mean ± SD) of the hydrogel-treated wounds were significantly less \((26 ± 20\%)\) than those of the saline-treated wounds \((64 ± 16\%)\) \((p < 0.02)\) evaluated in the last week of inclusion (Fig. 1). During the period of the study five of the hydrogel-treated ulcers healed, whereas none of the saline-treated ulcers did. The hydrogel-treated group needed fewer weekly revisions of necrotic tissue \((7\%\) compared with \(21\%\) in the saline-treated group, \(p < 0.03)\). Six patients in the saline group developed necrotic tissue with infection and therefore needed surgical revision after which they were no longer included in the study. In general all dressings had to be changed every day with no significant differences in leakage of exudate from the wounds (Table II).

### DISCUSSION

In the present study an amorphous hydrocolloid used to fill the cavity of pressure sores reduced healing time compared with wounds treated by wet saline compresses. Furthermore the hydrocolloid had an inhibiting effect on the development of necrotic tissue thereby reducing the need for debridement, making it feasible to treat patients in their home environment.

A moist environment increases healing of ulcers (2) and a hydrocolloid dressing is advantageous in the treatment of pressure sores compared with saline gauze compresses (1). However, hydrocolloid sheets adhere quite tightly to the skin, which might be damaged when the sheet is removed. When using the amorphous form of hydrocolloid this problem is avoided and furthermore there is direct contact between the hydrocolloid and the pressure sore.

### Table I. Some characteristics of the patients treated with hydrogel and control (saline meshes). Data are expressed as median (range) except where otherwise stated

<table>
<thead>
<tr>
<th></th>
<th>Hydrogel ((n = 17))</th>
<th>Control ((n = 15))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>82 (32–97)</td>
<td>84 (46–89)</td>
</tr>
<tr>
<td>Sex:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Female</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>46 (35–108)</td>
<td>50 (30–80)</td>
</tr>
<tr>
<td>Wound stage</td>
<td>4 (3–4)</td>
<td>4 (3–4)</td>
</tr>
</tbody>
</table>

### Table II. Results of the treatment of pressure sores with hydrogel compared with saline meshes (control). Data are expressed as median (range) except where otherwise stated

<table>
<thead>
<tr>
<th></th>
<th>Hydrogel ((n = 17))</th>
<th>Control ((n = 15))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need for debridement ((%) of all weekly changes)</td>
<td>7*</td>
<td>21</td>
</tr>
<tr>
<td>Smell</td>
<td>1–4</td>
<td>2 (1–4)</td>
</tr>
<tr>
<td>Pain during treatment</td>
<td>1–4</td>
<td>2 (1–3)</td>
</tr>
<tr>
<td>Comfort during use</td>
<td>1–5</td>
<td>4 (3–4)</td>
</tr>
<tr>
<td>Length of time dressing</td>
<td>1 (1–7)</td>
<td>1 (0.5–1)</td>
</tr>
</tbody>
</table>

* \(p < 0.03\).
itself. In the present study the hydrocolloid filling the cavity resulted in less need for debridement, and cultivation of an environment for the development of granulation tissue; healing therefore improved. Because hydrocolloids consist of hydrophilic polymers hydrated almost to saturation, the cavities of the pressure sores in this study were kept moist and created better conditions for healing (2).

However, other measures have to be initiated in the treatment of pressure sores such as the relief of pressure itself and mobilisation. Another point is that early surgical consultation is associated with increased healing in patients admitted to hospital (3). This signifies the important role of initial removal of devitalised tissues to decrease the risk of infection and promote healing.

In conclusion, a new amorphous hydrocolloid reduced healing time of pressure sores, indicating that it is suitable for the treatment of elderly patients in their own homes.

REFERENCES


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