Comparative Evaluation of Collagen Dressing Versus Conventional Dressing in Burns and Chronic Wounds: A Comparative Study

K.C. Panwar¹, Abhishek Panwar²

ABSTRACT

Background: Burn injuries to the skin result in loss of its protective function as a barrier to micro-organisms leading to the high risk of infection. Various dressing materials have been used for dressing the burn wounds. Hence; we planned the present study to evaluate and compare the efficacy of Collagen Dressing and Conventional Dressing in Burns and Chronic Wounds. Materials & Methods: We did evaluation and comparison of efficacy of Collagen Dressing and Conventional Dressing in Burns and Chronic Wounds. A total of 50 patients were included in the present study and were broadly divided into two study groups; Group A and Group B. Group A included patients who were treated with collagen dressing while group B included patients who were treated with conventional dressing. We collected all the data details from the patients including the size of the wound, edge and floor characteristics of the wound. We cultured swab and pus culture after four days as per hospital’s protocol. Patient’s response to the treatment in both the study groups were recorded and evaluated by SPSS software. Results: Most common type of wound encountered in both the study groups was decubitus type. We didn’t observe any significant difference while comparing the number of cases completely treated after seven weeks. Conclusion: In terms of complete healing, no significant difference exists in between collagen dressing and conventional dressing.

Key words: Burns, Collagen, Conventional

INTRODUCTION

Burn injuries to the skin result in loss of its protective function as a barrier to micro-organisms leading to the high risk of infection. Thus, burn patients face high morbidity than mortality because of the large uncovered burn surface getting infected, healing of which takes long periods of dressings, leading to deformities and contractures.¹,² Unfortunately, the management of the burn wounds still remains a matter of debate and an ideal dressing for burn wounds has not been discovered. Moreover, in developing countries, burn management is riddled with difficulties.³ Significant advancements have been made in patient care, including tracking wound healing, developing novel graft and coverage options, controlling inflammation, optimizing dietary needs, and testing unique pharmacological interventions. As a result of these efforts, patient survival has improved along with a concomitant decrease in the length of stay, which in turn results in a decreased cost to the patient and the medical providers.⁴⁻⁵ Various dressing materials have been used for dressing the burn wounds such as amniotic membrane, boiled potato peel, banana leaf, soframycin cream, silver sulfadiazene, skin grafting, epidermal growth factor, honey dressing, etc.⁶⁻⁸ Hence; we planned the present study to evaluate and compare the efficacy of Collagen Dressing and Conventional Dressing in Burns and Chronic Wounds: A Comparative Study. Int Arch BioMed Clin Res. 2018;4(1):114-116.
Dressing in Burns and Chronic Wounds.

METHODS
We planned the present study in the department of General Surgery of M.G. Hospital, Bhilwara, Rajasthan, and included evaluation and comparison of efficacy of Collagen Dressing and Conventional Dressing in Burns and Chronic Wounds. Ethical approval was taken from institutional ethical committee and written consent was obtained from all the patients after explaining in detail the entire research protocol. Complete demographic details of all the patients were obtained. A total of 50 patients were included in the present study and were broadly divided into two study groups; Group A and Group B. Group A included patients who were treated with collagen dressing while group B included patients who were treated with conventional dressing. Both group consisted of 25 patients each. Exclusion criteria for the present study included:

- Patients with presence of uncontrolled diabetes,
- Patients with history of any liver disease,
- Patients with history of any other systemic illness,
- Patients with any known drug allergy,
- Patients between the age group of 25 to 50 years.

We collected all the data details from the patients including the size of the wood, edge and floor characteristics of the wound. We cultured swab and pus culture after four days as per hospital’s protocol. Through cleaning of the affected area was done before applying the collagen dressing. Complete debridement of the infected wound was done. Collagen sheets of appropriate size were selected. Firm application of the collagen sheets was done on the raw wound surface. Warm air-dryer was used for drying the dressing. Wounds of the patients of the conventional group were dressed with povidone iodine. Antibiotic treatment was done in both the groups based on the culture reports. Patient’s response to the treatment were recorded and evaluated by SPSS software. Chi-square test was used for evaluation of level of significance. P-value of less than 0.05 was taken as significant.

RESULTS
A total of 50 patients were included in the present study and were divided into two study groups; group A included patients who were given collagen dressing while group B included patients who were given conventional dressing. Mean age of the patients of group A and group B was 39.5 and 42.1 years respectively. Out of 25, 18 patients in group A were males while 6 patients in group B were males. Most common type of wound encountered in both the study groups was decubitus type. We didn’t observe any significant difference while comparing the number of cases completely treated after seven weeks.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group A (n=25)</th>
<th>Group B (n=25)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>18</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td>7</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Mean age (years)</td>
<td>39.5</td>
<td>42.1</td>
<td></td>
</tr>
<tr>
<td>Type of wound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decubitus</td>
<td>8</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Venous</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Post-burn</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Comparison of treatment outcome

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Group A (n=25)</th>
<th>Group B (n=25)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with complete wound closure at seven weeks’ time</td>
<td>18</td>
<td>17</td>
<td>0.51</td>
</tr>
</tbody>
</table>

DISCUSSION
In the present study, while comparing the conventional dressing and collagen dressing, we didn’t observe any significant difference. Singh O et al compared the efficacy of collagen dressing in treating burn and chronic wounds with that of conventional dressing materials. The records of 120 patients with chronic wounds of varied aetiologies and with mean age 43.7 years were collected and analyzed. The patients had been treated either with collagen or other conventional dressing materials including silver sulfadiazine, nadifloxacin, povidone iodine, or honey (traditional dressing material). Patients with co-morbidities that could grossly affect the wound healing like uncontrolled diabetes mellitus, chronic liver or renal disease, or major nutritional deprivation were not included. For the purpose of comparison the patients were divided into two groups; ‘Collagen group’ and ‘Conventional group’, each having 60 patients. For assessment the wound characteristics (size, edge, floor, slough, granulation tissue, and wound swab or pus culture sensitivity results) were recorded. With start of treatment, appearance of granulation tissue, completeness of healing, need for skin grafting, and patients’ satisfaction was noted for each patient in both groups. With two weeks of treatment, 60% of the ‘collagen group’ wounds and only 42% of the ‘conventional group’ wounds were sterile (P=0.03). Healthy granulation tissue appeared earlier over collagen-dressed wounds than over conventionally treated wounds (P=0.03). After eight weeks, 52 (87%) of ‘collagen group’ wounds and 48 (80%) of ‘conventional group’ wounds were >75% healed (P=0.21). Eight patients in the ‘collagen group’ and 12 in the ‘conventional group’ needed partial split-skin grafting (P=0.04). Collagen-treated patients enjoyed early and more subjective mobility. No significant better results in terms of completeness of healing of burn and chronic wounds between collagen dressing and conventional dressing were found. Baghel PS et al compared the effect of honey dressing and silver-sulfadiazene (SSD) dressing on wound healing in burn patients. Patients (n=78) of both sexes, with age group between 10 and 50 years and with first and second degree of burn of less than 50% of TBSA (Total body surface area) were included in the study, over a period of 2 years (2006-08). After stabilization, patients were randomly attributed into two groups: ‘honey group’ and ‘SSD group’. Time elapsed since burn was recorded. After washing with normal saline, undiluted pure honey was applied over the wounds of patients in the honey group (n=37) and SSD cream over the wounds of patients in SSD group (n=41), every day. Wound was dressed with sterile gauze, cotton pads and bandaged. Status of the wound was assessed every third and seventh day and on the day of completion of study. Patients were followed up every fortnight till epithelialization. The bacteriological examination of the wound was done every seventh day. The mean age for case (honey group) and control (SSD group) was 34.5 years and 28.5 years, respectively. Wound swab culture was positive in...
29 out of 36 patients who came within 8 hours of burn and in all patients who came after 24 hours. The average duration of healing in patients treated with honey and SSD dressing at any time of admission was 18.16 and 32.68 days, respectively. Wound of all those patients (100%) who reported within 1 hour became sterile with honey dressing in less than 7 days while none with SSD. All of the wounds became sterile in less than 21 days with honey, while this was so in only 36.5% with SSD treated wounds. The honey group included 33 patients reported within 24 hour of injury, and 26 out of them had complete outcome at 2 months of follow-up, while numbers for the SSD group were 32 and 12. Complete outcome for any admission point of time after 2 months was noted in 81% and 37% of patients in the honey group and the SSD group. Honey dressing improves wound healing, makes the wound sterile in lesser time, has a better outcome in terms of prevention of hypertrophic scarring and post-burn contractures, and decreases the need of debridement irrespective of time of admission, when compared to SSD dressing.\(^{[10]}\)

Gupta SS et al evaluated the effect of honey dressing and silver sulfadiazene (SSD) dressing on wound healing in burn patients. They retrospectively reviewed the records of 108 patients (14-68 years of age), with first and second degree burns of less than 50% of the total body surface area admitted to our institution, over a period of 5 years (2004-2008). Fifty-one patients were treated with honey dressings and 57 with SSD. Time elapsed since burn, site, percentage, degree and depth of burns, results of culture sensitivity at various time intervals, duration of healing, formation of post-treatment hypertrophic scar, and/or contracture were recorded and analyzed. The average duration of healing was 18.16 and 32.68 days for the honey and SSD group, respectively. Wounds of all patients reporting within 1 h of burns became sterile with the honey dressing in less than 7 days while there was none with SSD. All wounds treated with honey became sterile within 21 days while for SSD-treated wounds, this figure was 36.5%.

A complete outcome was seen in 81% of all patients in the “honey group” while in only 37% patients in the “SSD group.” Honey dressings make the wounds sterile in less time, enhance healing, and have a better outcome in terms of hypertrophic scars and postburn contractures, as compared to SSD dressings.\(^{[11]}\)

### CONCLUSION

Under the light of above results, the authors concluded that in terms of complete healing, we didn’t observe any significant difference in between collagen dressing and conventional dressing. However, future studies are required for better exploration of this field of medicine.

### REFERENCES