

Research Article

A study on newer dressing materials versus conventional dressing materials in ulcer healing

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ABSTRACT

Background: The dressing of wounds is an old art and has undergone a wide variety of changes from ancient herbal dressing to modern dressing materials. The main aim was always to heal the wounds. Wounds and their management are fundamental in the practice of surgery. The prevalence of leg ulceration is approximately 1% to 2%, and is slightly higher in the older adult population. The main aim of the study was to compare the newer dressing materials versus the conventional dressing materials in terms of various factors responsible for wound healing.

Methods: A total of one hundred patients admitted in surgery ward were allotted into two groups – conventional dressing materials (regime A) and newer dressing materials (regime B) on random basis. The patients were assessed on daily basis in both test and control groups with parameters like ulcer size, rate of granulation tissue formation, time required for removal of slough and rate of wound healing.

Results: Out of 100 cases studied, maximum numbers of patients were in age group 51 to 60 years (23%). With use of Regime A we have noticed that healing stage in 1 patient was within 7 days, 8 patients between 8-14 days, 13 patients between 15-21 days and 28 patients between 22-30 days. With use of Regime B we have noticed healing stage in 4 patients was within 7 days, 13 patients between 8-14 days, 19 patients between 15-21 days and 14 patients between 22-30 days.

Conclusions: As per study carried out we would conclude that newer dressing materials are more efficient as compared to conventional dressing materials in all stages of ulcer healing even though there is slight compromise in its availability.

Keywords: Dressing materials, Conventional, Newer, Ulcer, Method

INTRODUCTION

The dressing of wounds is an old art and has undergone a wide variety of changes from ancient herbal dressing to modern dressing materials. The main aim was always to heal the wounds. Wounds and their management are the main fundamental in the practice of surgery. The prevalence of leg ulceration is approximately 1% to 2% and is slightly higher in the older adult population.¹

The words quoted by Luodon and published in 1805 are very much summarized on leg ulcer management “ulcers on the leg form a very extensive and important class of disease where the treatment of such cases is generally considered as an inferior branch of practice, an unpleasant and inglorious task where labor must be bestowed and little honour gained”.² Chronic leg ulcers is usually associated with significant morbidity, high cost of healthcare, loss of productivity, and reduced quality of life.^{1,3-13}

An ideal wound care product in addition to control the infection should also protect the normal tissues and must not interfere with the normal wound healing. Various treatment modalities have been discovered over the years in forms of different types of wound dressings like creams, ointments, solutions while other classes of wound dressings are occlusive dressing, non-occlusive dressing, absorptive dressing, skin substitutes, and negative suction vacuum dressing.

METHODS

The study was carried out in surgery department of C.U Shah Medical College, Surendranagar, Gujarat state, India from 1st August 2013 to 31st August 2015. The study was prospective, observational and longitudinal. Study protocol of the procedure was formed along with Proforma, Patient Information Sheet and Informed Consent Form. A total of one hundred patients admitted in surgery ward were allotted into two groups – conventional dressing materials (Regime A) and newer dressing materials (Regime B) on random basis. Povidone iodine, H₂O₂, EUSOL and liquid paraffin are the conventional materials which are compared with the newer materials such as oxum, oxoferine, collagen and opsite. The wounds were thoroughly debrided; dimensions and surface area of ulcers were also assessed. The patients will be assessed on daily basis with the following parameters.

1. Ulcer size at the start of the treatment and the changes with the treatment.
2. Rate of granulation tissue formation
3. Time required for removal of slough
4. Rate of healing of wound

RESULTS

This study includes a total of 100 patients with maximum age group between 51 to 60 (23%) years. Mean age of the

patient in Regime A was (46.2 ± 16.97) years while in Regime B mean age is (45.86 ± 18.38) years. A total of 35 females were enrolled during this study, out of which 16 patients were considered in Regime A and 19 patients in Regime B. 65 males were enrolled in this study, out of which 34 are included in Regime A and 31 in Regime B. 19% patient healing ulcer, 78% patient had non-healing ulcer while 3% had callus ulcer.

In Regime A, 17 patients (34%) had ulcer size less than 5 cm, 22 patients (44%) had ulcer size between 5-10 cm and 11 patients (22%) had ulcer size greater than 10 cm at time of dressing. In regime B, 19 patients (38%) had ulcer size less than 5 cm, 16 patients (32%) had ulcer size between 5-10 cm and 15 patients (30%) had ulcer size greater than 10 cm at the time of dressing. In Regime A, 41 patients (82%) had ulcer with slough and 9 patients (18%) had ulcer without slough. In Regime B, 44 patients (88%) had ulcer with slough and 6 patients (12%) had ulcer without slough. In Regime A, 33 patients (66%) had ulcer with purulent discharge and 17 patients (34%) had ulcer with non-purulent discharge. In Regime B, 37 patients (74%) had ulcer with purulent discharge and 13 patients (26%) had ulcer with non-purulent discharge.

DISCUSSION

It is every surgeon's desire that after dressing the wound should heal without any complications and it's a doctor's responsibility to make sure that the dressing is done effectively.

But with the everyday addition of newer dressing material to the existing dressing material, it is necessary to identify the best dressing material for the patient and a detailed study, comparison of these dressing materials is required.

Table 1: Result of the two regimes.

Parameters	Type of Regime	0-7 days	8-14 days	15-21 days	22-28 days
Appearance of Granulation tissue	A	7	14	20	9
	B	10	17	23	0
Absence of purulent discharge	Type of Regime	0-7 days	8-14 days	15-21 days	22-28 days
	A	20	11	2	0
	B	28	9	0	0
Removal of slough	Type of Regime	0-7 days	8-14 days	15-21 days	22-28 days
	A	22	19	0	0
	B	31	13	0	0
Healing stage achieved	Type of Regime	0-7 days	8-14 days	15-21 days	22-30 days
	A	1	8	13	28
	B	4	13	19	14

In this study, dressing materials commonly used in surgical wards are compared with the newer ones. The materials are tested according to its different wound outcome variables and statistically analyzed if they are different or not. Their clinical comparison was carried out as conventional and newer dressing materials and no internal comparison of individual material was done.

In present study, all the patients underwent debridement to have a clean ulcer base. According to Bergstorm W, Benett MA, Cartston CE et al in 1994¹⁴ and by Goode PS et al in 1995¹⁵ that the presence of necrotic and devitalized tissue may prevent or delay wound healing.

In the present study, men show increased number of ulcers (65%) as compared to females (35%) as per the second national data source, NHDC documented higher hospital rates in male.¹⁶ According to Lawerance et al study which is compared to the present study shows higher incidence of ulcers in male, as they are the breadwinners of the family and are mostly working outdoor which makes them more vulnerable for trauma and sequels.¹⁷

In Regime B, there was earlier appearance of granulation tissue (10.88 ± 3.22 days) as compared to regime A (13.86 ± 3.22 days).

Study conducted by Kapur V et al on diabetic foot ulcer, chronic leg ulcers patients and acute abscesses which were treated with oxum showed early granulation and epithelisation resulted in earlier resolution of peri-wound erythema and peri-wound edema compared to PI group at a mean of 21 days.¹⁸

According to Anand A et al when compared the efficacy of oxum versus PI in post C-section wounds, 88% of granulation was seen in 5 days in oxum treated group and 80% in Povidone iodine (PI) group in 10 days. 4% patients in oxum group had erythema at surgical wound in 5 days when compared to 12% in PI group. The results were similar to our study although done on ulcers.¹⁹

In Regime B, there was early removal of slough from ulcer (6.25 ± 1.63 days) when compared to Regime A (8.87 ± 2.78 days). A study conducted by Chittoria RK et al on role of oxum in the management of diabetic foot ulcers in Andhra Pradesh on 20 patients, 19 cases were shown negative for infection after 5 days.²⁰

In Regime B there was a absence of purulent discharge from ulcer (5.75 ± 1.55 days) as compared to regime A (7.54 ± 2.5 days).

According to Goretti C study Povidone iodine has shown to be an effective antimicrobial agent for the treatment of various conditions and is routinely used for the management of chronic wounds. The significance of

faster healing time and shorter duration of antibiotic therapy in patients treated with oxum indicates that oxum has superior antimicrobial activity than Povidone iodine. In our present study there was sign of earlier wound disinfection in oxum group compared to Povidone iodine group.²¹

In regime B early healing stage (16.88 ± 5.35 days) was observed compared to regime A (21.02 ± 5.88 days), which has statistically significant ($p < 0.05$) value. Paola LD conducted a study on 218 patients suffering from chronic diabetic foot ulcers out of which 110 patients were treated with oxum and 108 patients treated with povidone iodine. The mean healing time was lower in the oxum group (45 ± 14) days than Povidone Iodine group (58 ± 20) days.²² It has also been reported that collagen dressing in the treatment of diabetic foot ulcer was more beneficial and enhanced the healing compared with conventional dressing.²³

A study conducted by Veves A 2002 between patients of age group 23-86 years at least one with diabetic ulcer randomized to receive collagen and conventional dressing which showed improved ulcer healing with collagen dressing over conventional dressing.²⁴

The global efficacy evaluation also confirms the superiority of Superoxidized solution over Povidone iodine as good to excellent. Efficacy response was also relatively more in Oxum treated group patients than Povidone-iodine treated group.²⁵⁻²⁷

Hence in the current study healing rate of ulcers was fast when treated with newer dressing materials (Oxum, opsite, oxoferin, collagen) compared to conventional dressing material (Povidone iodine, H_2O_2 , EUSOL, Paraffin) which proves newer dressing materials to be safer, more efficient and superior as a wound care product than conventional dressing materials in the management of ulcers.

CONCLUSION

As per the study which includes conventional and newer dressing regimes in the treatment of the ulcer shows more favorable results for newer dressing materials when compared to conventional dressing material in healing ulcers which are statistically significant as described below.

Patients treated with newer dressing materials shows that the time required for the removal of slough was almost two days earlier compared to conventional dressing materials and the time required for achieving the absence of purulent discharge from ulcer shows 2 days earlier with the newer dressing materials compared to conventional dressing materials. The time required for the appearance of granulation tissue by newer dressing

materials took three days when compared to the conventional dressing materials and finally the time required for the healing ulcer took four days early with newer dressing materials compared to conventional dressing materials.

Therefore on the basis of our study I would like to conclude that newer dressing materials are more efficient as compared to conventional dressing materials in all stages of ulcer healing even though there is slight compromise in its availability.

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