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ROLE OF WOUND BED PREPARATION IN THE MANAGEMENT OF CHRONIC NON HEALING ULCER

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ABSTRACT

A wound must be clean to heal and wounds which are not cleaned heal slowly or not at all and also get a reduced supply of blood.[1] Wound debridement is a method used to remove dead and infected tissue from a wound.[2] Any infection in the tissue can also spread to nearby areas or to other parts of the body through the blood. Wound debridement can be done through a surgical procedure or various other methods. So to solve the problem in the management of wound, contaminated with dead tissue or slough, Safe and effective wound debridement to keep the wound clean is a requirement for the management of Dustavrana (Ch. non healing ulcer). *Sushruta*, the father of Ayurvedic Surgery, have described a number of drugs for Vrana Sodhana(wound cleaning agents) and Vrana Ropan (healing agents). Sushruta mention Kshar (alkali material) as a drug which has the property of Sodhan (cleaning), Ropan (healing), Pachan , Vilyan and Lekhan (scrapping), so the local application of Kshar in the form of a Pichu (gauge pice) has been taken as debriding agent and it also promotes the healing of chronic non healing ulcer.[3]

KEYWORDS: Kshar pichu,Wound Debridement,Wound Bed Prepration.

INTRODUCTION

The wound have been as long as there has been life and so there was always a question arises to solve this problem. The process of healing which is a natural phenomenon starts right from the time of injury and continuous in a predictable sequential fashion till the formation of a healthy scar.[4] The defense mechanism of our body like phagocytosis and local enzymatic action on dead tissue helps to keep a wound clean, but when the surface area of wound is very large, the necrotic tissue or slough is too much then auto cleansing mechanism of our body is insufficient. The contaminating material is removed by certain artificial method. Such cleaning process of contaminated wound is called wound debridement.[5] The aim of wound-bed management can be summarised as the active creation of an optimal wound-healing environment through planned interventions. wound-bed management should be considered for chronic wounds that are not progressing through a normal wound-healing process .[6]

The overall management goal is to achieve a stable wound - characterised by a well-vascularised, moist wound bed with minimal 'excess' exudate . The chronicity of a wound is the result of an imbalance within systems, for example cellular alterations - increased enzyme levels (matrix metalloproteases (MMPs)), a decreased number of available active macrophages and/or a decreased number of active growth factors.[7]It has been previously reported that effective wound-bed management involves the:

Removal of necrotic/fibrinous tissue

Control of oedema

Achievement of a well-vascularised wound bed

Decrease of bacterial burden

Minimisation of wound exudate.

The debridement methods used for them are surgical, chemical and mechanical debridement. The surgical debridement is the best method but it has serious drawbacks as it requires anesthesia and causes profuse bleeding due to damage of healthy tissue. [8]Even the chemical and enzymatic debriding agents used have injurious effects on healthy granulation tissues as they sometimes get absorbed from the wound surface and produce generalized undesirable effects / side effects.[9]

Sushruta, the father of Ayurvedic surgery, was well aware for normal wound healing, he propounded, practiced and described a number of drugs for vrana sodhana(wound debridement)and vrana ropan(wound healing). *Sushruta* has mentioned kshar as a drug which

has the property of sodhan (debridement), ropan (healing), pachan (digestive), vilyan (dissolving), and lekhan (scrapping).

Local application of kshar in the form of pichu(medicatedgauge)is known as Ksharpichu .ksharpichu has been taken as vranasodhan(wounddebridement)and vrana ropan(wound healing) for the effective management of dusta vrana. In this study we have used Apamarga, Snuhi and Haridra for the preparation of Kshar pichu in these Snuhi and Apamarga act as a debriding agent and Haridra act at as healing agent.

MATERIAL AND METHOD

A cotton gauze piece of size 20×20 cm was soaked in the snuhi ksheer and then apamarga kshar was sprinkled over it, then dry it. this process was repeated five times and after the fifth time this gauze piece should de dipped in the solution of haridra, then dry it. This gauze piece kept in a proper sterilized container, the pichu was used as then required.

Plan of study

Present study was carried out in 20 cases of Chronic non healing wound. These all cases were randomly divided in two groups containing equal number of patients i.e., 10 patients in each group.

1. **Group A** Treated group with hydrogen peroxide and Chlorine water as local application
2. **Group B** This is trial group which was treated with kshar pichu for Cleaning & Dressing as local medicament.

Assessment criteria

1- Clinical features
   - A. Pain
   - B. Discharge
   - C. Slough

2. Measurement of wound
   - A. Linear measurement – Length, Width, Depth, Area
   - B. Tracing
   - C. Photography
   - D. Unit healing time

After culture and sensitivity of the discharge of the Dushta vrana (Chronic non healing wound), the kshar pichu was used for cleaning of the wound and applied over wound. The dressing was changed daily. Culture of the wound was taken in subsequent stages to assess the bacteriological status of the wound.

In controlled group after cleaning the wound with hydrogen peroxide/chlorine water ,a gauze piece soaked in chlorine water was applied over the wound .this procedure was repeated every day and the sequential change in the wound were recorded on day 5, 10, 15 ,20,…till the wound healed completely.

RESULT

Our objective was to prepare a clean floor of wound by using this ksharpichu i.e. "wound bed prepration" after that simple dressing was needed for further healing. In present study the prepared kshar pichu was applied locally on various wounds and results have been assessed according to the Assessment criteria and also by Measurement of wound i.e. wound contraction study. [10]

Table No. 1: Statistical analysis of pain in both groups.

Group	Initial	Mean and sd Follow up					Mean diff I-F_4	Paired T-test p-value
	I	F_1	F_2	F_3	F_4	F_5		
A	2.30± 0.823	1.90± 0.568	1.00± 0.471	0.60± 0.516	0.00± 0.000	0	2.300± 0.823	t=8.835 p <0.001 S
B	2.20± 0.789	2.00± 0.667	1.30± 0.483	1.20± 0.422	0.40± 0.516	0	1.800± 0.422	t=13.500 p<0.001 S

Pain – No-0, Mild No Analgesic-1, Moderate, Mild analgesic-2, Severe full dose of analgesic-3.

A statistical analysis of pain was carried out initially and at first, second, third and fourth follows up in both groups. In group A, initially mean was 2.30 (± 0.823) and at fourth follow up was 0.00 (±0.00). Mean difference in initial and fourth follow up was 2.30 (±0.823). In group B, initially mean was 2.20 (± 0.789) and at IV follow up was 0.40 (±0.516). Mean difference was 1.80 (±0.422). (Table No. 1)

Table No. 2: Statistical analysis of discharge in both groups.

Group	Initial	Follow up				Mean diff I-F_3	Paired T-test p-value
	I	F_1	F_2	F_3	F_4		
A	2.70± 0.483	2.40± 0.516	1.70± 0.675	1.20± 0.422	0.40	2.300± 0.483	t=15.057 p<0.001 S
B	2.70± 0.483	1.70± 0.483	0.90± 0.568	0.40± 0.516	0.0	2.700± 0.483	t=17.676 p<0.001 S

Discharge – No-0, Serous 2-5 ml-1, Seropurulent >5 ml - 2, Purulent, offensive odour > 5 ml - 3.

The statistical analysis of discharge in both groups revealed that in Group A initially mean was 2.70 (±0.483) and at fourth follow up it was 0.40. Mean difference was 2.30 (±0.483). In Group B, initial mean was 2.70 (±0.483) and at third follow up it was 0.40 (±0.516) and the mean difference was 2.70 (±0.483). (Table No. 2).

Table No. 3: Statistical analysis of slough in both groups.

Group	Initial	Follow up				Mean diff I-F_3	Paired T-test p-value
	I	F_1	F_2	F_3	F_4		
A	53.00± 29.458	34.00±2 3.664	19.00±1 9.120	8.00± 13.166	0.0	45.00± 29.458	t=5.689p<0.001 S
B	46.00± 30.984	25.00±2 0.683	6.00± 10.750	0.00± 0.000	0.0	46.00± 30.984	t=4.695p<0.001 S

Slough in %- how much surface area of wound covered by slough was denoted in %

The statistical analysis of slough in both groups revealed that in Group A initially mean was 53.00 (±29.45) and at third follow up it was 8.00 (±13.166). Mean difference was 45.00 (±29.45). In Group B, initial mean was 46.00 (±30.98) and at third follow up it was 0.00 (±0.00) and the mean difference was 46.00 (±30.98). (Table No. 3).

Table No. 4a: Statistical analysis of Unit Healing Time (UHT)in both groups.

Unit Healing Time	F-1	F-2	F-3	F-4	F-5	F-6	F-7	F-8	F-9	F-10
Group A	2.42± .6926	2.17± .6583	1.87± 0.494	1.24± 0.75	.75± 0.69	.57± 0.63	0.51± 0.57	0.17± 0.39	0.16± 0.36	0.00± 0.00
Group B	2.30± .6380	1.50± .880	1.30± 0.755	0.69± 0.75	0.62± 0.67	0.60± 0.65	0.29± 0.47	0.08± 0.26	0.051± 0.16	0.00± 0.00

Table No. 4b: Statistical analysis of Unit Healing Time (UHT) in both groups.

Group	Follow up		Mean diff F_1-F_5	Paired T-test p-value
	F_1	F_5		
A	2.42± 0.6926	0.75±0.69	2.37± 0.781	t=9.610 p=0.001 HS
B	2.30±0.6380	0.62±0.67	2.41±0.57	t=12.638 p=0.001 HS

Statistical analysis of Unit Healing Time (UHT) in both groups by paired T-test was done in between Initial SA and fifth follow up UHT mean difference in group-A was 2.37 (±0.781) and in group-B was 2.41 (±0.57). (Table No. 4a&4b).

Mean pain score decrease gradually in various follow up in both the group. Mean of pain score decrease in group A at 4th followup in comparison to initial was 2.30 where as it decreased 1.80 in group B both were highly significant and pain significantly reduced in group A earlier than group B (trial drug treated). It may be due to irritant properties of ingredients of kshar pichu. there was no significant difference in mean pain score in group A &B at 1st, 2nd, & 3rd follow up the difference was significant in 4th &5th follow up. (Table No. 1).

Mean discharge score decrease gradually in various follow up in both the group. Mean of discharge score decrease in group A at 4th followup in comparison to initial was 2.30 where as it decreased 2.70 in group B both were highly significant and discharge significantly reduced in group B (trial drug treated) earlier than group A .Decrease in discharge in Group B, may be due to shoshan, stambhan, quality of trial drug's ingredients.(S.Su5/11)[1]. This might be because of these quality. There was no significant difference in mean discharge score in group A &B at 1st follow up the difference was significant in, 2nd & 3rd, 4th & 5th follow up. (Table No. 2).

Mean slough score decrease gradually in various follow up in both the group. Mean of slough score decrease in group A at 4th followup in comparison to initial was 45.0 where as it decreased 46.0 in group B both were highly significant. Slough significantly reduced in group B (trial drug treated) earlier than group A .Slough was also peel out easily and earlier in treated group B instead of group-A; it shows the shodhan property and there was presence of proteolytic enzyme in the snuhi ksheer which dissolves all the dead tissues and there was no significant difference in mean slough score in group A &B at 1st ,2nd, follow up the difference was significant in 3rd & 4th follow up. (Table No. 3).

Mean unit healing time decrease gradually in various follow up in both the group. Mean of U.H.T. decrease in group A at 5th followup in comparison to initial was 2.37 where as it decreased 2.41 in group B both were highly significant and Unit Healing Time (UHT) significantly reduced in group B (trial drug treated) earlier than group A. Unit Healing Time (UHT) of wound was significantly reduced in group B rather than group A. Reducing period of U.H.T. may be due to ropan & soshan guna of trial drug as stated by Sushruta. (Table No.4).

CONCLUSION

The analysis of observations and results to evaluate the efficacy of trial drug ksharpichu as a Wound debriding agent in the management of Dushta vrana (Chronic non healing wound) can be concluded as following points.Topical application of trial drug reduces slough and discharge of the surrounding tissue substantially. The shodhana (Wound Debridement) and ropana (Wound Healing) karma of trial drug is found efficacious. Initially drug acts as a debriding agent, remove slough, necrotic agent from wound and subsequently promotes smooth and uncomplicated healing process. The dressing soaked with trial drug provides moist environment to the wound which helps in wound bed preparation resultant enhances the granulation tissue formation and epithelialization.

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