Study of the Efficacy of Ksharaplota in Dushtavrana w.s.r to Infected Wound

Research Article

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Abstract

Vrana (wound and ulcer) & process of healing is the soul of Shalyatantra Chikitsa (Surgical treatment). Dushta Vrana means getting vitiated by Dosha & hence Dushta Vrana or infected wound is characterized by bad smell, abnormal color with profuse discharge, severe pain and longer healing time. The severity of infected wounds and their vast range of etiologies, The treatment is cleaning & dressing the wound or it can be more extensive. It may require surgical intervention to close the wound and stabilize the patient. Acharya Sushruta defines Kshara as the substance possessing Ksharan & Kshanan properties. Ksharaplota formulation was selected and applied over the affected infected wound with the help of gauze piece. During the preparation of Ksharaplota, it is coated with Snuhi kshira, Apamarga kshara & Haridra. All these drugs are Shodhana & Ropana. It was observed that Ksharaplota has the properties as sustained release of drug, absorbs discharges, less painful & easily acceptable by the patient with excellent Sodhana & Ropana Karma. The clinical study has been done on 438 patients, selected randomly and divided in two groups. Group A 220 patients i.e. trial group, were treated with local application of Ksharaplota. The Group B 218 patients i.e. control group, were treated with Gold standard. The clinical assessment was done on the basis of clinical presentation of Dushta Vrana, (Infected wound) before and after the treatment. As grading used for assessment of parameters which were ordinal in nature, “Wilcoxon Signed Ranks test” was used for within the group assessment (i.e. before and after treatment of a group). For between the group assessment of parameters, Mann Whitney – U test was applied. We had tested hypothesis for each parameter and result was interpreted accordingly. The level of significance was kept at 5% (P=0.05). And the result of the present study found significant.

Key Words: Dushtavrana, Ksharaplota, Vranakovida, Infected Wound, Alkaline Medicated Gauze.

Introduction

Vrana and Shalyatantra are two terms that are analogous to each other and therefore considered two sides of the same coin. Vrana & process of healing is the soul of Shalyatantra. Even in the definition of Shalyatantra, Sushruta emphasizes more on Vrana vinishchityarthar (1) which means Vrana Nidana, Lakshana, Samprapti, Upadrava and Chikitsa. In the time of Sushruta, Vranakovida (2) was considered a type of super specialty for those who had expertise of diagnosis, prognosis & management of Vrana which therefore stimulated research scholars to gain expertise in management of Vrana with different skilful modalities (3).

Dushta Vrana means getting vitiated by Dosha & hence Dushta Vrana or infected wound is characterized by bad smell, abnormal colour with profuse discharge, severe pain and longer healing time (4). Dushta Vrana or infected wounds are typically defined as cuts, lacerations, puncture, pathological in nature and cause damage to both skin & underlying tissues (5).

General treatment process for infected wound is cleaning, using sterile saline solution & extracting debris from the wound (6). An antibiotic gel is applied to prevent infection & then a sterile dressing is applied to keep the wound clean & protected. (7) Usually patient avoids surgical debridement due to pain, fear & psychological factors. Therefore there is scope for non surgical debridement modalities which are also known as parasurgical methods. Acharya Sushruta has mentioned Kshara (8) in Anu-shastra, Upayantra, Agropaharaniya and one of the Upakram of Vrana.

Local application of Kshararakarma i.e. Pratisarana, studies proved Shodhana & Ropan properties of Kshara in the management of Dushta Vrana but during procedure of application (Avachurana), there are some drawbacks while applying Kshara as it cannot be spread uniformly, very painful while spreading due to direct exposure, it can be used only for short duration, procedure of Kshara karma requires help of instruments and intervention by skill full medical person, absences of Vrana Strava Shoshana (absorption of discharge & necrotic tissues) & also the

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Materials used for department of Materials for trial group (A)

Materials and Methods

Shodhana (management of) was conducted. Dushta Vrana states that “After the purification (Shodhana) of wound there is no further need of treatment since the wound heals (Vrana) itself”. (14)

It was observed that Ksharaplota has the properties as sustained release of drug, absorbs discharge, less painful & easily acceptable by the patient with excellent Sodhana & Ropana (16). Hence present study “Study The Efficacy Of Ksharaplota In Dushta Vrana w.s.r to Infected Wound.” was being conducted.

Thus in present study, an effort was made to establish the scientific validity of Ksharaplota in the management of Dushta Vrana and investigate its Sodhana (debridment) and Ropana (wound healing) properties.

Materials and Methods

Materials for trial group (A)

- Ksharaplota
- Bandage

Preparation of Ksharaplota (17)

Ksharaplota was prepared at the Institute’s department of Shalyatantra Following were the materials used for Ksharaplota preparation.

- Shukhkshira (Euphorbia neriifolia)
- Apamarg Kshara (Achyranthusaspera)
- Haridra churna (Curcuma longa)
- Single layer Gauze piece
- Wooden Ring
- Cabinet

Snuhi kshira (18)

It was collected by taking an incision over the stem of Snuhi plant. The secreted milk (Kshir) was collected and stored in a pot. As Snuhi Kshira has a tendency to coagulate early, hence every time fresh Snuhi Kshira was taken.

Apamarga Kshara (19)

Whole Apamarga plant was to be taken and cut in pieces, after drying the plant in shade It was burned in light fire and ash was collected. The ash was dissolved in water, in the ratio 1:6. i.e.1 part ash and 6 parts water. The solution, so formed was filtered with the help of percolator. Residual ash was again dissolved in 4 parts of water and the same procedure was repeated at least twice in order to take away all the alkaline material from the ash. Ultimately, the ash remains as a neutral residue, which should be thrown, the fluid was filtered several times (filtering once in a day) and finally, the Apamarga Kshara was obtained by evaporating the filtered solution.

Haridra (20)

Dry rhizomes of Haridra Plant were cut into pieces and powdered which was then sieved through a fine cloth. The fine powder thus obtained was stored in clean and sterile container.

Gauze Piece

According to Sushruta, gauze piece is similar to plota. It is a piece of woven surgical wool. A single layer gauze piece was used over a circular wooden ring having diameter of 23 cm to obtain the required Ksharaplota.

Wooden ring

A structure of double ring was used to hold the gauze piece. With the help of this ring, gauze piece was held tightly so that coating of Snuhi kshiria, Apamarga kshara & Haridra was made very easy & effective.

Cabinet (21)

It was used for drying the Ksharaplota. The prepared Ksharaplota on wooden rings was kept in a air tight cabinet for drying, sterilization & storage purpose.

Ksharaplota preparation

A Round gauze piece, 23 cm in diameter was fixed over the doubled layered circular wooden ring. This gauze piece was made so tight that the coating can be done uniformly. Initially on 1st day 50 ml Sunhikshira was applied with the help of small cotton swab over the gauze on its entire circumference. The wet coated gauze with rings was place inside the cabinet for drying for 1 day. On 2nd day dried gauze was again smeared with 50ml 1 Sunhikshira followed by 20 gms of Apamargakshara This was again dried in the cabinet for a day. On 3rd day dried gauze was again smeared with 50 ml Sunhikshira followed by 20 gms Haridra churna. The prepared gauze was kept in the cabinet for drying (22).
In this way the Ksharaplota was prepared having coating each of Snuhikshira (150 ml) Apamargakshara (20 gms.) & Haridra churna (20 gms.). The prepared Ksharaplota is then cut into 6 x 6 cm. pieces and sealed in sterile polythene packs. Ksharaplota should be preferably kept in the cabinet for safety storage as well as sterilization.

Materials for Control Group (B)
- Normal Saline (N.S)
- Hydrogen Peroxide Solution(H_2O_2)
- Chlorinated Lime Water Boric Acid Solution (Eusol)
- Povidine - Iodine 0.5\%w /v available Povidine (Betadine)
- Sterile Pad
- Bandage

Inclusion Criteria
- Patients having sign & symptoms of DushtaVrana w.r.t to traumatic lacerated infected wound over extremities.
- Within size upto length 6 cm and breadth 6 cm.
- Patients of either sex will selected.
- The patients between the age group of 16-70 years.

Exclusion Criteria
- Anaemic patient Hb<10 gm %.
- Malnourish patient (As per age, height & weight proportion.)
- Bleeding disorders( Increased B.T & C.T)
- Patient in septicemia
- The patients suffering from systemic disease such as AIDS, Tuberculosis, Diabetes mellitus, Hepatitis-B, Malignancy, Vericose ulcer, Deep vein thrombosis, Arterial ulcer, Neurogenic ulcer, Leprosy, Pregnancy, Acute & Chronic renal failure, Jaundice & cirrhosis of liver.

Laboratory investigations
- Hemoglobin percentage
- Total WBC count.
- Differential count.
- Erythrocyte sedimentation rate
- Platelet count
- B.T & C.T
- Blood sugar level.
- Tridot test.
- Hepatitis –B (HbsAg)
- Sr. Creatinine.
- Urine sugar.
- Urine albumin.
- Urine microscopic examination.

Criteria of Assessment
- Pain Assessment will be done by Visual Analog Scale.
- Daha (Burning Sensation) Assessment will be done by Visual Analog Scale.
- Kandu (Itching) Assessment will be done by Visual Analog Scale.

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<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
<td>No Strava / Dry Dressing</td>
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<tr>
<td>1</td>
<td>Gauze is slightly moist</td>
</tr>
<tr>
<td>2</td>
<td>After opening the bandage gauze is completely wet</td>
</tr>
<tr>
<td>3</td>
<td>Bandage is completely moist within 24 hours but no need to change the dressing</td>
</tr>
<tr>
<td>4</td>
<td>Bandage is completely moist within 24 hours and bandage is to be changed</td>
</tr>
</tbody>
</table>

Consistency of Strava (Discharge)
- 0 Absent
- 1 Prulent
- 2 Mucopurulent
- 3 Scanty
- 4 Copious

Gandha (Malodor)
- 0 Non Existence
- 1 Minimum Bad Smell
- 2 Mild Bad Smell
- 3 Unpleasant Smell but tolerable
- 4 Foul smell which is intolerable

Wound Floor (Bed)
- 0 Smooth Regular Floor and healthy granulation tissue
- 1 Smooth regular floor with slight discharge with absence of slough
- 2 Smooth irregular, slight discharge, less granulation tissue and presence of slough
- 3 Rough floor and presence of slough with moderate discharge
- 4 Rough irregular floor with more slough and profuse discharge

Tenderness
- 0 No tenderness
- 1 Tenderness on palpation
- 2 Tenderness on touch
- 3 Unable to touch

Wound Area
- Surface area of wound measured by graph paper
- Healed Surface Area = x
- Actual Surface Area of wound on day 0 = A_0
- Unhealed surface area remained on last day = A_L
- X = A_0 – A_L
- Percentage of Healed Wound Area = (X / A_0) x 100

Unit Healing Time
(Total number of days during Treatment) / (A_0 - A_L)
Overall result

<table>
<thead>
<tr>
<th>Class</th>
<th>Percentage of improvement (Total relief in symptoms)</th>
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<tr>
<td>Cured</td>
<td>75-100 %</td>
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<tr>
<td>Markedly improved</td>
<td>50-74 %</td>
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<tr>
<td>Moderately improved</td>
<td>25-49 %</td>
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<tr>
<td>Not Improved (Unchanged)</td>
<td>00-24 %</td>
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</table>

Trial group (A) - Ksharaplota
- In this group the infected wound was washed with normal saline.
- Then the Ksharaplota was kept and bandaged with sterile dressing once in a day.
- On next day the Ksharaplota was changed.
- This procedure was done till the appearance of Shuddha Vrana Lakshanas or upto 14 days whichever was early.

Control group (B) - Application of H$_2$O, Eusol, Povidine
- In this group the infected wound was washed with Normal Saline.
- A local application of H$_2$O$_2$, Eusol, Povidine sequentially was then applied once in a day & properly bandaged with sterile dressing.
- On the next day same procedure was repeated till the appearance of Shuddha Vrana Lakshanas or upto 14 days whichever was early.
- After 14 days or on attaining Shuddha Vrana Lakshanas (Sign of healing wound ) further management for both groups (Trial & Control) will be only Normal Saline dressing followed by sterile bandaging which should done on alternate day till complete epithelialization was seen or for 1 month whichever was early.

Table No. 1

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Particulars</th>
<th>Trial Group (A)</th>
<th>Control Group (B)</th>
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<tr>
<td>1</td>
<td>Drug</td>
<td>Ksharaplota</td>
<td>H$_2$O, Eusol, Povidine</td>
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<tr>
<td>2</td>
<td>Route</td>
<td>Local</td>
<td>Local</td>
</tr>
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<td>3</td>
<td>Frequency</td>
<td>Once Daily</td>
<td>Once Daily</td>
</tr>
<tr>
<td>4</td>
<td>Duration</td>
<td>14 Days or till appearance of Shuddha Vrana Lakshanas</td>
<td>14 Days or till appearance of Shuddha Vrana Lakshanas</td>
</tr>
<tr>
<td>5</td>
<td>Sample size</td>
<td>220</td>
<td>218</td>
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</table>

Observation of the Study Gender
Out of 218 patients in control group, 118 (54.13%) were male and 100 (45.87 %) patients were female. In trial group, out of 220 patients 116 (52.73%) patients were male while 104 (47.27%) were female.

The Age group of the selected cases for the study was 16-70 years divided into 4 age groups viz. 16-30 years, 30-45 years, 45-60 years and Above 60 years. Majority of the 241 cases i.e. 55% were between the age group of 30-45 years. In control group, out of 218 patients, 116 (53.21%) were from 30 to 45 years, 60 (27.52%) patients were from age group 16 to 30 years, 40 (18.35 %) patients from 45 to 60 years while 02 (00.92 %) belongs to age group 60 years & above. In trial group, out of 220 patients, 125 (56.82%) were from 30 to 45 years, 53 (24.09%) patients were from age group 16 to 30 years, 40 (18.18 %) patients from 45 to 60 years while 02 (00.91 %) belongs to age group 60 years & above.

Marital status
Regarding marital status, from control group, out of 218 patients, 159 (72.94%) were married while 59 (27.06 %) were unmarried. Similarly from trial group, out of 220 patients 161(73.18%) were married while 59 (26.82%) were unmarried.

Religion
Regarding religion wise distribution of cases from control group, out of 218 patients, 187 (85.78%) were Hindu, 14(06.42%) were Muslim, 11 (05.05 %) patients from Christian religion while 06 (02.75 %) belongs to Buddha. Similarly from trial group, out of 220 patients, 189 (85.91%) were Hindu, 13( 5.91%) were Muslim, 11 (05.00 %) patients from Christian religion while 07 (03.18 %) belongs to Buddhist community. Thus maximum patients belonged to Hindu religion which might be due to the dominance of Hindu religion in the society.

Socio-economic status
In control group, out of 218 patients, 139 (63.76%) patients were from middle class, 35(16.06%) were from rich class, while 44 (20.18 %) belonged to poor class. Similarly in trial group, out of 220 patients, 143 (65%) patients were from middle class, 34(15.45%) were from rich class, while 43 (19.55 %) belongs to poor class. Thus, maximum patients belonged to middle class.

Educational status
In control group, out of 218 patients, 45 (20.64%) patients were illiterate, 63(28.90%) had primary education, 93 (42.66 %) patients completed their graduation while 17 (07.80 %) had done their post graduation. From trial group, out of 220 patients, 44 (20.00%) patients were illiterate, 62(28.18%) had primary education, 97 (44.09 %) patients completed their graduation while 17 (07.73 %) completed their post graduation.

Occupation
In control group, out of 218 patients, 41 (18.80%) patients were students, 28 (12.84%) were labour, 27(12.39 %) patients were government employee, 38 (17.43 %) were from agricultural field, 46 (21.10%) were house wives, 19 (08.72 %) patients were...
farmers while 19 (08.72 %) belonged to other occupations. From trial group, out of 220 patients, 44 (20%) patients were students, 27 (12.27%) were labour, 28(12.73 %) were from agricultural field, 38 (18.64%) were house wives, 24 (19.91 %) patients were farmer while 18 (08.18 %) belonged to other occupations.

Sleep
In control group, out of 218 patients, 138 (63.30%) patients had good sleep, 51(23.39%) were had sound sleep, while 29 (13.30 %) were had disturbed sleep. In trial group, out of 220 patients, 139(68.18% ) patients had good sleep, 53(24.09%) had sound sleep, while 28 (12.73 %) were having disturbed sleep.

Deha prakruti
In control group, out of 218 patients, 83 (38.07%) patients were of Vata-pittaj prakruti, 91(41.74%) were of Kapha-pittaj prakruti, while 44(20.18 %) were having Vata-kaphaj prakruti. In trial group, out of 220 patients, 88 (40%) patients were of Vata-pittaj prakruti, 88(40%) were having Kapha-pittaj prakruti, while 44(20%) had Vata-kaphaj prakruti.

Manas Prakruti
In control group, out of 218 patients, 104 (47.71%) patients were having Rajasik prakruti, 114(52.29%) were having Tamasik prakruti, while no patient belonged to Satvik prakruti In trial group, out of 220 patients, 106 (48.18%) patients were having Rajasik prakruti, 114(51.82%) were having Tamasik prakruti, while no patient belonged to Satvik prakruti.

Sarata
In control group, out of 218 patients, 25(14.47%) patients were having Pravara sarata, 121(55.50%) had Madhya sarata, while 72 (33.03%) patients had Avar sarata.

In trial group, out of 220 patients, 26(11.82%) patients had Pravara sarata, 123 (55.91%) had Madhya sarata, while 71 (32.27%) patients had Avar sarata.

Result of the Study
As grading used for assessment of parameters which were ordinal in nature, “Wilcoxon Signed Ranks test” was used for within the group assessment (i.e. before and after treatment of a group). For between the group assessment of parameters, Mann Whitney – U test was applied.

We had tested hypothesis for each parameter and result was interpreted accordingly. The level of significance was kept at 5% (P=0.05). Proper summary statistics like mean, mean difference, median difference were provided along with graphs and diagrams.

<table>
<thead>
<tr>
<th>Table 2: Effect on Vedana</th>
<th>Mean Score</th>
<th>Median Difference</th>
<th>Sample size</th>
<th>Wilcoxon signed rank test (T Value)</th>
<th>P value</th>
<th>Inference</th>
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<td>Vedana</td>
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<td>BT</td>
<td>AT</td>
<td>Diff.</td>
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<tr>
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<td>7.546</td>
<td>3.959</td>
<td>3.587</td>
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<td>P&lt;0.0001</td>
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<td>Trial Group</td>
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<td>3.614</td>
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<th>Table 3: Effect on Daha</th>
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<th>Wilcoxon signed rank test</th>
<th>P value</th>
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<tr>
<td>Daha</td>
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<td>Diff.</td>
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<tr>
<td>Control Group</td>
<td>6.977</td>
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<table>
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<tr>
<th>Table 4: Effect on Tenderness</th>
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<th>Wilcoxon signed rank test</th>
<th>P value</th>
<th>Inference</th>
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<tr>
<td>Tenderness</td>
<td></td>
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<tr>
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<td>AT</td>
<td>Diff.</td>
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<tr>
<td>Control Group</td>
<td>2.564</td>
<td>0.9725</td>
<td>1.592</td>
<td>2</td>
<td>(T+)=23871 (T–)=0</td>
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<td>Trial Group</td>
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<td>1.550</td>
<td>2</td>
<td>(T+)=24090 (T–)=0</td>
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### Table 5: Effect on Kandu

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<th>Kandu</th>
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<th>Median Difference</th>
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<td>Diff.</td>
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<tr>
<td>Control Group</td>
<td>1.99</td>
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<td>Trial Group</td>
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<td>1.018</td>
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### Table 6: Effect on Discharge

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<th>Median Difference</th>
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<th>Wilcoxon signed rank test (T Value)</th>
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### Table 7: Effect on Gandha

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<th>Gandha</th>
<th>Mean Score</th>
<th>Median Difference</th>
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<th>P value</th>
<th>Inference</th>
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<tbody>
<tr>
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<tr>
<td>Control Group</td>
<td>2.092</td>
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<tr>
<td>Trial Group</td>
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<td>(T+)=24310 (T-)=0</td>
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### Table 8: Effect on Wound floor bed

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<th>Wound floor</th>
<th>Mean Score</th>
<th>Median Difference</th>
<th>Sample size</th>
<th>Wilcoxon signed rank test (T Value)</th>
<th>P value</th>
<th>Inference</th>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>2.986</td>
<td>0.0092</td>
<td>2.98</td>
<td>3</td>
<td>218</td>
<td>(T+)=23871 (T-)=0</td>
</tr>
<tr>
<td>Trial Group</td>
<td>2.991</td>
<td>0.0091</td>
<td>2.982</td>
<td>3</td>
<td>220</td>
<td>(T+)=24310 (T-)=0</td>
</tr>
</tbody>
</table>

### Table 9: Effect on Consistency of discharge

<table>
<thead>
<tr>
<th>Consistency of Discharge</th>
<th>Mean Score</th>
<th>Median difference</th>
<th>Sample size</th>
<th>Wilcoxon signed rank test(T Value)</th>
<th>P value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT</td>
<td>AT</td>
<td>Diff.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>2.99</td>
<td>0.0092</td>
<td>2.965</td>
<td>3</td>
<td>218</td>
<td>(T+)=10296 (T-)=0</td>
</tr>
<tr>
<td>Trial Group</td>
<td>2.991</td>
<td>0.0091</td>
<td>2.98</td>
<td>3</td>
<td>220</td>
<td>(T+)=24310 (T-)=0</td>
</tr>
</tbody>
</table>

### Table 10: Effect on Wound Area

<table>
<thead>
<tr>
<th>Wound Area</th>
<th>Mean Score</th>
<th>Median Difference</th>
<th>Sample size</th>
<th>Wilcoxon signed rank test (T Value)</th>
<th>P value</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT</td>
<td>AT</td>
<td>Diff.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>2.266</td>
<td>0.9862</td>
<td>1.28</td>
<td>1</td>
<td>218</td>
<td>(T+)=23871 (T-)=0</td>
</tr>
<tr>
<td>Trial Group</td>
<td>2.268</td>
<td>0.9909</td>
<td>1.277</td>
<td>1</td>
<td>220</td>
<td>(T+)=24310 (T-)=0</td>
</tr>
</tbody>
</table>


From control group out of 218 patients in the study 1 patient i.e.(0.46%) was totally cured while 217 i.e.(99.54%) patients were had marked improvement in their complaints. Similarly from trial group out of 220 i.e.(100%) patients, had marked improvement in their complaints.

**Discussion**

*Ksharaplota* composed of *Snuhi & Apamaraga* has *Ksharan* and *Kshanan* properties, *Apamargakshara* also cauterize tissue by its *Ksharana Guna* while *Haridra* offers *Krimighana & Ropana* properties thus provides *VranaShodhana & VranaRopana* effect. Chemical properties of *Ksharaplota* remove unhealthy tissue and alkaline nature of *Kshar* offers aseptic and antimicrobial effect thus reduces chance of secondary infection. *Snuhi* component of *Ksharaplota* provides moisturizing effect due to its sticky property which ultimately promotes epidermal migration resulting enhanced synthesis of connective tissue. The *Snuhi* latex having binding property therefore retains surgical benefits (debridement, scraping, hemostatic, aseptic, antiseptic and healing effect) of *Apamargakshara* for longer time. *SnuhiKshira, Apamargakshara* and *Haridra* support biological action of each other and not contraindicated when applied together. Sustained release action of *Ksharaplota* medication releases ingredient slowly and make available medicine for longer duration to achieve complete healing of chronic wound.

*Ksharaplota* overall possess penetrating, scraping, draining, debridement, sclerosing, healing, antibacterial and anti inflammatory effect in the management of wound and cuts. All three ingredients contribute significantly towards mode of action as follows (23).

*Snuhi* (Latex of *Euphorbia nerifolia*) *Kshira* possess properties such as; *Lekhana, Vedanasthapana, Rakthashodhak* and *Vishaghana* due to *Katu & Tikshana Rasa* and *Ushna Virya*. The latex of plant also found to have rubifacient, irritant and powerful caustic action when applied to a raw surface; it also offers analgesic, anti-inflammatory, wound healing and antibacterial activity. It is believe that *Euphorbia nerifolia* enhances wound healing process by promoting tensile strength, epithelization and angiogenesis.

*Apamarga* (*Achyranthus aspera*) *Kshara* offers *Lekhana, Chedana, Bhedana, Ropana, Kushtaghna, Shodhana* and *Krimighana* properties due to *Katu & lavana Rasa* and *Ushna Virya*. *Katu Rasa* contributes towards *Shonit*.

*Sanghat Bhinnati* action of *Apamarg Kshara* which breakdown pus pockets and blood clots at the site of *Vrana*. *Apamarg Kshara* also possesses analgesic, antiinflammatory, hemostasis and antibacterial activity which offers symptomatic relief in *Vrana*.

*Tikta & Laghu Guna* and *Ushanya Virya* of *Haridra* (*Curcuma longa*) provides *Varnya, Sandhana, Vedanashamaka, Raktaastambak, Rakthashuddhikar* and *Lekhana* properties. It enhances capillaries vasodilation when applied locally thus facilitates wound debridement (*Shodhana*) and wound healing (*Ropana*) process. It also possesses anti-inflammatory, analgesic and antibacterial activity.

**Conclusion**

- *Ksharaplota* proved significantly effective in reducing *Vrana Veden* (*Vrana Daha, Vrana Kandu*, *Vrana Srava* and *Vrana Shotha*).
- *Ksharploita* showed satisfactory outcome in healing of wound as compared to *H2O2 + Eusol + Povidone* application.
- The aim of the study was to assess the efficacy of *Ksharaplota* in the management of *Dushta Vrana* with the objective to give relief to patients of *Dushta Vrana* having symptoms like *Vrana Veden*, *Srava*, *Kandu, Daha Shotha*. This objective was achieved both clinically and statistically.
- On the other hand *Ksharaplota* achieved statistically significant efficacy over modern Gold
standard drugs used for dressing like \( \text{H}_2\text{O}_2 \) + Eusol + Povidone.

- Therefore it can be concluded that (Ksharaplota) is the effective with benefit of cost, free from hazard, easy procedure and tolerable to the patient.
- Ksharaplota can be useful as first choice among Para surgical procedure in the management of Dushta Vrana (infected wound).

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