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Role of *Daruharidra Rasakriya Lepa* in the management of *Dushta Vrana* w.s.r. to Chronic Non-Healing Ulcer : A Clinical Study

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ABSTRACT

Background: *Vrana* is an interruption of continuity of body tissue or part by physical, microbial, chemical or immunological causes, typically associated with loss of function. *Vrana* can be correlated with wounds and ulcers. Normally, *Vranas* are healed by itself if kept clean. Wound factors delay wound healing. The presence of infection, insufficient blood supply, tissue tension, radiation, malnutrition, diabetes, consumption of steroids etc. are the important factors which delay the wound healing process. *Dushta Vrana* is one of the *Vranas* which needs time for its healing. Acharya Sushruta mentioned *Rasakriya* under *Shasti Upakramas* for management of *Vrana*. Any drug formulation should possess two qualities for proper wound healing i.e., *Vrana Shodhana* (Making free from undesirable wound factors) and *Vrana Ropana* (Closure of the wound). Many formulations are in use for centuries. One of them is *Daruharidrarakriya*. The objective of the present study is to evaluate the effect of *Daruharidrarakriya* on the basis of relief in signs and symptoms of *Dushta Vrana*. **Materials and Methods:** In this study, *Lepa* of *Daruharidrarakriya* was applied on affected part of 25 patients selected from *Shalya* OPD, GAMC&H, Akhnoor, for the management of *Vrana*. **Results:** The results observed based on the relief obtained on the subjective and objective parameters taken for consideration for this study viz. Pain, Size of ulcer, Discharge, Base (granulation tissue) and were found significant on all the above parameters. **Conclusion:** It showed that *Daruharidrarakriya* significantly helped in reduction of the signs and symptoms of the *Dushta Vrana*, enhancing wound healing process and reducing the morbidity of the patients.

Key words: *Vrana*, *Dushta Vrana*, *Daruharidrarakriya*, Wound Healing

INTRODUCTION

Acharaya Sushruta defines *Vrana* as:

Vrunoti Yasmat Rudeapi Vranavastu Na Nashyati

Aadeha Dharanat Tasmad Vranaityuchyate Budhai ^[1]

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It is said that *Vrana* is that which covers the skin and the *Vranavastu*, that is scar tissue remains on body till the person survives. *Vranavastu* can be said as scar or a mark that is seen remaining only in broad and deep wounds but not in thin and superficial ones. He elaborates derivation of word *Vrana* in *Dwivraniyachikitsa*. It is derived from the root word '*Vrana*' which means splitting/ discontinuity. Acharya Dalhana also mentions meaning of *Vrana* as causing discolouration of the body or its parts.^[2] *Vrana* can be co-related with wound and ulcers.

An ulcer is break in the continuity of the covering epithelium, skin or mucus membrane. It may either follow molecular death of the surface epithelium or its traumatic removal. Chronic wounds are defined as wounds that fail to proceed through the normal phases of wound healing in an orderly and timely manner. The common causes are venous disease, arterial disease,

and neuropathy. Less common causes are metabolic disorders, haematological disorders and infective diseases.^[3]

Classification of Vrana^[4]

Vrana are classified into two main types on the basis of Hetu:

(A). Nijavrana: Endogenous Vranas caused by the vitiation of doshas. It is of 5 types:

1. Vataj
2. Pittaj
3. Kaphaja
4. Sannipataj
5. Raktaj

(B). Agantujavrana: It is caused by external factors like Vadha, Bandha, fall or injury due to fangs, bites etc. It is of 6 types:

1. Chinna (Incised wound)
2. Bhinna (Lacerated wound)
3. Vhiddha (Punctured wound)
4. Kshata (Lacerated wound)
5. Picchita (Contused wound)
6. Ghrishta (Abrasion)

Vrana can also be classified according to the involvement of Doshas (*Dosha Prasara*):

(A). Shuddhavrana

(B). Ashuddhavrana: It can be classified into 15 types:

1. Vataj
2. Pittaj
3. Kaphaja
4. Raktaj
5. Vata-Pittaj
6. Vata-Kaphaj
7. Pitta-Kaphaj
8. Vata-Raktaj

9. Pitta-Raktaj

10. Kapha-Raktaj

11. Vata-Pitta-Raktaj

12. Vata-Kapha-Raktaj

13. Pitta-Kapha-Raktaj

14. Vata-Pitta-Kaphaj

15. Vata-Pitta-Kapha-Raktaj

Chronic wounds can be classified as vascular ulcers (e.g., venous and arterial ulcers), diabetic ulcers, and pressure ulcers. Some common features shared by each of these wounds include prolonged or excessive inflammation, persistent infections, formation of drug-resistant microbial bio-films, and the inability of dermal and/or epidermal cells to respond to reparative stimuli.

Venous Ulcers: In venous disease, ulcers are usually located in the gaiter area between the ankle and the calf, often on the medial aspect of the leg. Venous ulcers arise from venous valve incompetence.

Arterial Ulcers: Arterial ulceration typically occurs over the toes, heels, and bony prominences of the foot i.e. ulcer appears "punched out" with well-demarcated edges and a pale, non-granulating and necrotic base. These occur as a result of reduced arterial blood flow and in turn, reduced tissue perfusion.

Diabetic Ulcers: Diabetic patients are at higher risk for arterial diseases and neuropathy, therefore, can develop ulcers due to both entities. In addition, hyperglycemia poses the risk of ulcers secondary to neuropathic impairment of sensory, motor, and autonomic function, typically in the hand and foot, or "stocking and glove" distributions.

Pressure Ulcers: Pressure ulcers are, as their name implies, caused primarily by unrelieved pressure. They usually occur over bony prominences such as the sacrum or the heel but can occur on any part of the body subjected to pressure.^[5]

Stages of Vranaropana (Wound Healing)^[6]

1. **Shuddhavrana (Clean Wound):** The Vrana which is soft, smooth, color like tongue, painless with clear

margins and without discharge is termed as *Shuddhavrana*.

- 2. *Rhuhyamaanavrana* (Healing Wound):** The wound having color like pigeon, without any discharge, firm and full of granulation tissue is termed *Rhuhyamaanavrana*.
- 3. *Samyakrudhavrana* (Healed Wound):** The wound without any swelling, pain, any sign of inflammation, color similar to surrounding skin and a flat scar without any granulation is termed as *Samyakrudhavrana*.

Management of Vrana

Wound healing completes in three phases: Inflammatory, proliferative and remodelling. Granulation, collagen maturation and scar formation are some of the other phases of wound healing but are independent of each other.^[7] Normally wound factors delay wound healing. The presence of infection is one of the important factors which delay the wound healing process.

Dushta Vrana is one of the *Vranas* which needs time for its healing. For healing, it is necessary to remove the maximum *Dushti* by virtue of *Shodhana* and *Ropana*. Management of *Dushta Vrana* includes *Shodhana* (cleaning) both external and internal and *Ropana chikitsa* (wound healing). For *Antah Shodhana*, all types of *Panchakarma* help depending upon the Dosha involvement. *Bahya Shodhana* means cleaning of wound by using *Kashaya* of *Shodhanaga Dravyas*, *Varti*, *Kalka*, *Ghruta*, *Taila*, *Churna* and *Rasakriya*. *Vrana Ropana* should be done using drugs having healing properties. *Ropana* is always associated with *Shodhana* in Ayurveda because a wound cannot be healed if it is not *Shuddha*, so healing is only possible factor if *Vrana* is clean.^[8] Even though healing is a natural process, it is inhibited by various factors. Acharaya Sushruta has mentioned *Shastikupkramas* for the management of *Vranas*. One of these is *Rasakriya*.^[9]

Preparation of Rasakriya

Rasakriya is the form of preparation of the aqueous extract of the plant materials used by the Ayurvedic

Physicians. In this the 1 part of the drug(s) are made into coarse powder and boiled with 16 parts of water till only 4 parts of water remains. Then it is filtered and the filtrate is again heated on a low flame till it becomes semi-solid. This semisolid mixture is again dried in shade or drier to get a solid mass of extract. This is called as *Rasakriya*.^[10]

Rasakriya is indicated for *Shodhana* and *Ropana* effects:

1. *Shodhana Rasakriya* is applied to *Sthiramamsi* and *Dushta Vrana*.
2. *Ropana Rasakriya* is applied to *Sandhisthita*, *Pittaja*, *Raktaja* and *Abhighataj Vrana*.^[11]

Daruharidra Rasakriya

Daruharidra (*Berberis aristata*) is an important drug mentioned in classical texts of Ayurveda. It has *Tikta*, *Kashaya Rasa*; *Laghu*, *Rookshaguna*; *Katu Vipaka* and *Ushna Veerya*. The root bark of *Daruharidra* contains Berberine, quaternary ammonium salt of isoquinoline alkaloid. It has antibacterial, antifungal, antiviral, antioxidant, anti-inflammatory, anti-tumor and anti-diabetic properties. The qualities and uses of *Daruharidra* are:

1. *Vranajit* (Wound healing)
2. *Mehajit* (Cures diabetes)
3. *Shopha* (Swelling) *Hara*
4. *Kandu Kushtha* (Pruritus and Skin disorder) *Hara*
5. *Kaphaabhishyanda* (conjunctivitis) *Hara*^[12]

Preparation:

Daruharidraskriya is obtained by boiling the decoction of roots of *Daruharidra* until it becomes thick (*Ghana Avastha*). It is then cooled and this semi hard *Daruharidra Rasakriya* is obtained. This is then applied over the *Vrana*.^[10]

AIM AND OBJECTIVES

Aim

To study the clinical efficacy of *Daruharidra Rasakriya* and its role in the management of *Dushta Vrana* (Chronic non-healing ulcers).

Objectives

1. To promote healing in chronic non healing ulcers.
2. To reduce the size and depth of the ulcer.
3. To reduce the local inflammation and pain associated with the ulcer.

MATERIAL AND METHODS

25 patients above 18 years of age who had chronic non healing pedal ulcers (*Dushtavrana*) persisting for a duration more than 6 weeks were selected after informed consent for the study. All the patients underwent uniform assessment that included detailed medical history, local ulcer examination and systemic examination. ECG was conducted to rule out heart failure and ischemic heart diseases. Liver function tests and kidney function tests were performed to rule out renal and hepatic dysfunction. Some basic blood tests were conducted, including tests for ESR, CBC, HIV, HbsAg, HCV and wound cultures to look for wound infections. A wound biopsy and a detailed immunologic assay were not conducted owing to a variety of factors like the patient's financial constraints, fear of further wound healing delay, and lack of specificity in a definitive diagnosis.

Preparation of Vrana Lepa

Ingredients used are *Daruharidra Rasakriya* and *Madhu*. Before application of medicine, *Vranalepa* is prepared by mixing *Daruharidra* and honey into a fine paste.

Application:

The wound is cleaned with normal saline. After drying with sterile gauze, *Vranalepa* is applied over the wound followed by sterile pads as absorbent layer. The dressing is secured with bandages without compromising the circulation.

Inclusion Criteria

1. Patients between the age of 18-70 years were selected for the study.
2. Patients irrespective of their sex, occupation, were selected for the study.

3. Patients having clinical features of *Nija/Agantuja Dushta Vrana* i.e., foul smell, pus discharge, pain, burning sensation and edema were selected for study.

Exclusion Criteria

1. Patients suffering from systemic diseases like uncontrolled Diabetes mellitus were excluded from the study.
2. Patients with co-existing medical conditions such as heart failure, chronic liver disease, chronic renal disease, and chronic infectious diseases like tuberculosis (TB), HIV, hepatitis B, and hepatitis C were excluded from the study.
3. Patients suffering from grave conditions like malignant ulcers, Marjulin ulcers etc. were also excluded.
4. Patients on prolonged medication with corticosteroid, antidepressants, anticholinergics, immune suppressants, estrogen replacement therapy etc. or any other drugs that may have an influence on the outcome of the study.

Duration of treatment

Total 4 follow ups were taken of each patient in two months with first follow-up after 1 week and other 3 follow ups each after a gap of two weeks i.e.,

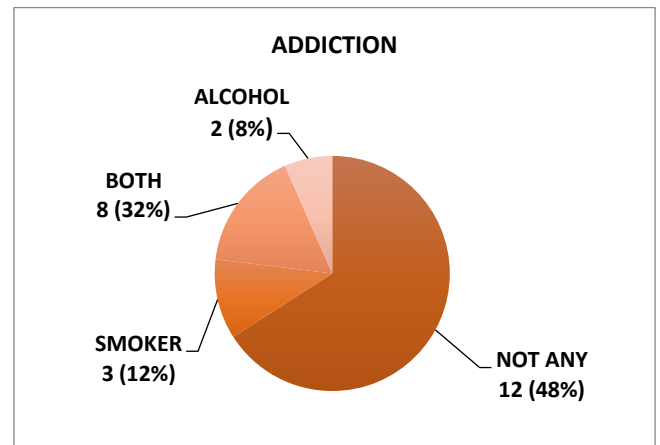
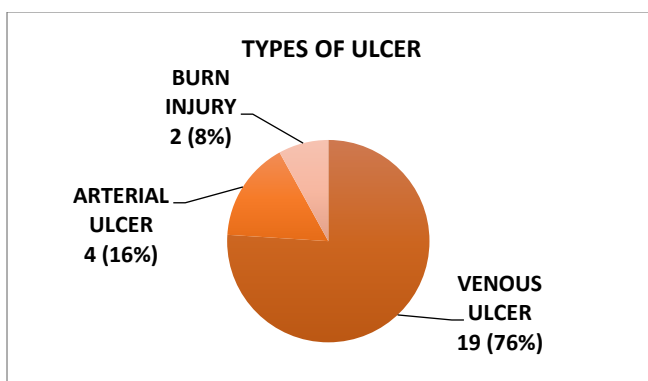
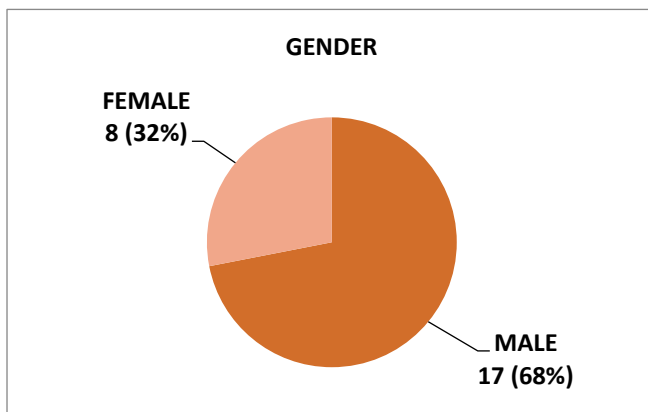
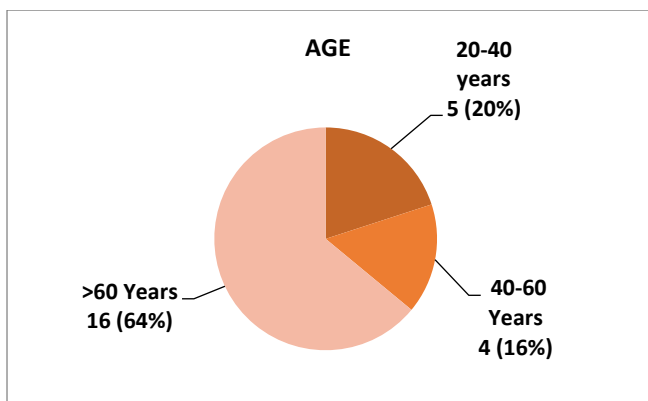
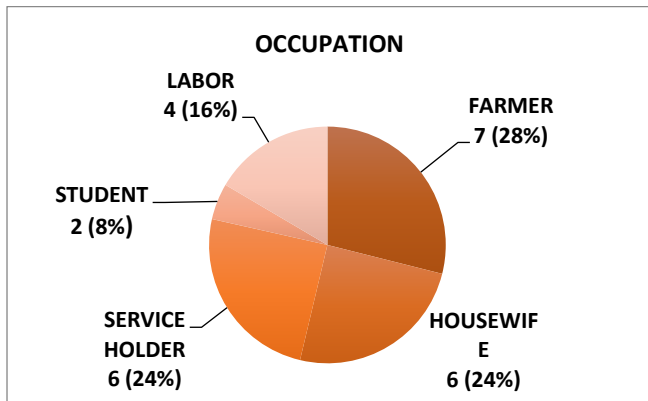
- Day 0 = Enrolment Day
- Day 7 = First follow-up
- Day 21 = Second follow-up
- Day 35 = Third follow-up
- Day 49 = Fourth follow-up

In the first week, dressing was done every day, for the next 2 weeks dressing was done every alternate day, then dressing was done twice a week for the next 2 weeks followed by once a week dressing in the next two weeks if required.

Statistical data of the selected patients

The clinical observations from different aspects of the treatment have been represented showing the

statistical analysis according to various factors like occupation, Gender, Age, type of ulcer and Addiction.



Assessment Criteria

1. Pain at the ulcer site

- G0-** Absence of pain, warmth, surrounding tissue edema
- G1-** Mild pain without surrounding tissue edema
- G2-** Moderate pain with mild surrounding tissue edema
- G3-** Increased pain with warmth and surrounding tissue edema

2. Size of the ulcer

- G0-** No ulcer seen, ulcer healed
- G1-** Small, shallow ulcer (<2cm in diameter)
- G2-** Larger ulcer (2-6cm in diameter)
- G3-** Extensive, deep ulcer (> 6 cm in diameter)

3. Exudate from the ulcer

- G0-** No exudate
- G1-** Minimal exudate
- G2-** Moderate exudate
- G3-** Heavy exudate, Malodorous

4. Base of the ulcer

- G0-** Healed
- G1-** Granulomatous
- G2-** Necrotic
- G3-** Eschar

OBSERVATION AND RESULTS

Table 1: Scoring pattern before treatment

| Assessment Criteria | Number of Patients | | | |
|---------------------|--------------------|----|----|----|
| | G0 | G1 | G2 | G3 |
| Pain | 5 | 9 | 8 | 3 |
| Size | 0 | 2 | 14 | 9 |
| Exudate | 1 | 6 | 11 | 7 |
| Base | 0 | 4 | 16 | 5 |

Table 2: Scoring pattern after treatment

| Assessment Criteria | Number of Patients | | | |
|---------------------|--------------------|----|----|----|
| | G0 | G1 | G2 | G3 |
| Pain | 15 | 7 | 3 | 0 |
| Size | 9 | 8 | 6 | 2 |
| Exudate | 13 | 8 | 4 | 0 |
| Base | 12 | 11 | 2 | 0 |

Fig. 1: Number of patients showing improvement after each follow-up

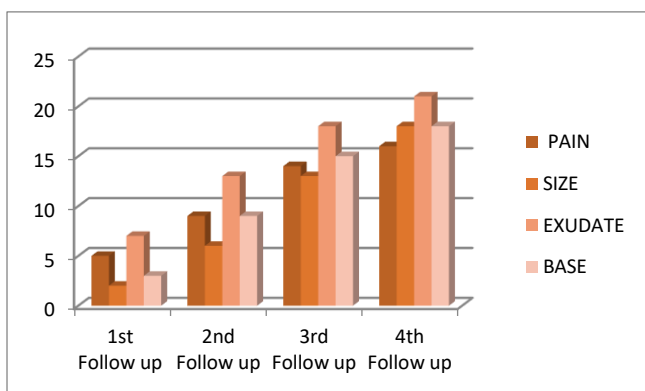


Table 3: Efficacy of Daruharidra Rasakriya in management of different aspects of Vrana

| Assessment Criteria | No. of Patient BT | No. of Patient AT | Improvement | Efficacy In % Age |
|---------------------|-------------------|-------------------|-------------|-------------------|
| Pain | 20 | 4 | 16 | 80% |

| | | | | |
|---------|----|---|----|-------|
| Size | 25 | 7 | 18 | 72% |
| Exudate | 24 | 3 | 21 | 87.5% |
| Base | 25 | 6 | 19 | 76% |

Before Treatment



After Treatment





Overall efficacy in percentage = 78.875%

DISCUSSION

Daruharidra (*Berberis aristata*), commonly used in Ayurvedic medicine, is well-known for its wound-healing properties, especially in the treatment of ulcers. When applied as a *Lepa* (paste), its mode of action in ulcer healing can be understood through several mechanisms:

Antimicrobial action: *Daruharidra* contains berberine, a potent alkaloid with strong antibacterial, antifungal, and antiviral properties. Palmitine and berberines both have bactericidal action and glycosides have anti-infective activity which combated the infection and thus prevented infections in the wound, which is crucial for proper healing.

Anti-inflammatory effect: The paste reduces local inflammation. Tannins, anthraquinones, berberine, and phytosterols - all are anti-inflammatory and thus prevented the prolongation of the initial phase and reduced the pain as well as tenderness, redness, swelling like features, which led to progress of the wound toward healing.

Antioxidant activity: *Daruharidra* is rich in antioxidants, which help neutralize free radicals in the ulcer site. Tannins and anthraquinones are known antioxidants and blood purifiers with anti-inflammatory actions. As the oxidation process hampers the wound healing, antioxidants protect the tissue from the oxidative damage, promoting faster tissue regeneration and repair.

Astringent action: Its astringent properties help in reducing exudate and drying the ulcer surface, which aids in faster wound closure and healing.

Promotion of granulation tissue formation: The use of *Daruharidra Lepa* promotes the growth of healthy granulation tissue, which is essential for the wound-healing process and helps in re-epithelialization. Tannins and phytosterols promoted the healing process by wound contraction with increased capillary formation and fibroblast proliferation, followed by enhanced rate of epithelialization.

Analgesic effect: It may help in reducing the pain associated with ulcers due to its analgesic properties.

In summary, *Daruharidra Lepa* heals ulcers by reducing infection, inflammation, and oxidative stress, while promoting tissue regeneration and wound closure.

CONCLUSION

An ulcer which is present for more than three months is considered as chronic ulcer. *Vranalepa* can be used effectively in the management of *Dushta Vrana* (chronic non healing ulcers). It helps avoid the painful procedure of debridement of slough in those who are unable to tolerate pain. It also does the action of *Shodhana* and *Ropana*. It does not only remove the unhealthy granulation tissue, but also improves wound healing with minimal scarring. Thus, it works by both its *Vranashodhana* and *Vranaropana* properties.

Local application of *Daruharidra Rasakriya* provided good result by reduction of the wound size and promotion of healing, and it proved to be cosmetically effective with least scar formation also. Pigmentation similar to that of skin was found as another added effect. No untoward effects were observed during the course of treatment. The clinical features were majorly improved in 3 weeks. The overall efficacy of *Daruharidra Rasakriya* was found to be 78.875%. It showed that *Daruharidra Rasakriya* significantly helped in reduction of the signs and symptoms of the *Dushta Vrana*, enhancing wound healing process and reducing the morbidity of the patients.

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