

## JALAUKA-AWACHARAN (APPLICATION OF LEECH) FOR THE MANAGEMENT OF PAIN IN *DUSTA VRANA* (NON-HEALING ULCER)

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### ABSTRACT

The healing of *Dustavrana* (non-healing ulcers) remains a major clinical challenge to the medical faculty throughout the world. There are many factors which affect wound healing. Pain is one of the most important factors which not only affect the healing of wounds but also bring a lot of discomforts to the patients. Though systemic and local drugs are available, still their roles in the management of pain are limited to a certain extent.

Sushruta advocated leech application in the management of non-healing ulcers ages ago. Based on this reference, a clinical study was done with patients having non-healing ulcers, having divided them into a leech applied group and a control group. Finally, results were evaluated with a Chi square test and it was found that leech application is significantly effective in the management of pain in non-healing ulcers.

**Key words:** *Dustavrana*, leech application, pain.

### INTRODUCTION

'Non-healing ulcers' literally means unhealthy wounds. According to Sushruta, it is a wound with signs and symptoms that are greatly covered or greatly exposed, very hard or very soft, greatly elevated or greatly depressed, very cold or very warm, having different colors, terrifying, filled with putrefying pus, blood, muscles, veins, ligaments etc, and foul smells accompanied with severe pain, burning, suppuration, redness, itching, swelling, eruptions and other complications and persistence for a long time<sup>1</sup> Charaka has defined non-healing ulcers as a foul smelling, discolored, painful and excessively discharging condition.<sup>2</sup>

All conditions which exhibit the signs of non-healing ulcers as defined above and in

which there is an indication of *Vrana Shodhana* (Cleaning), have been included in the category of non-healing ulcers in the present study.

**These are-** *Nadi vrana* (Sinus), *Pakva granthi*, *Balmik* (Carbuncle), *Vidradhi* (Abscess), *Pakva Shoth* (Superficial abscess), *Atidagha Vrana* (Burn wound), *Vishaj Vrana* (poisonous wound) etc.

In the non-healing ulcers pain is quite severe and under the influence of *Dosha* they involve, such as cutting, beating or tearing pain due to *Vata*, burning or scalding pain due to *Pitta* and itching with heaviness due to *Kapha*.

**Principles of the management of non-healing ulcers:**

The Ayurvedic *Samhita* adopted special principles for the management of non-healing ulcers, which include general and local cleaning (*Shodhana*). For general cleaning (systemic cleaning) *Vamana* and *Virechana* are mentioned and for local cleaning Sushruta specially mentioned **blood letting by means of leeches** in non-healing ulcers.

A wound should be washed with *Kashaya* (decoction) of herbs of either *Rajavriksadi gana* or *Surasadi gana* and oils medicated with the same herbs. Also, *Kshar* (Alkalies) or oil prepared with *Kshar* may be used for this purpose.

The methods of cleaning can be classified as follows-

1. Conservative measures - *Kashaya, Varti, Kalka, Tail* etc.
2. Para-surgical measures
  - *Dhoopan*
  - *Kshara – karma*
  - *Krimighna, Vishaghna, Patradana*
3. Surgical measures
  - *Chedana* (Excision)
  - *Bhedana* (Incision)
  - *Lekhana* (Scrapping)
  - *Eshana* (Probing)
  - *Aaharanam* (Extraction)
  - *Vyadhan* (Puncturing)
  - *Visravan* (Drainage)

Charaka says that the physicians who observe swelling (inflammation) as a prodromal sign in the beginning should apply blood letting to prevent the manifestation of wound. He also explains thirty six measures of treatment of wounds which involve anti-swelling measures ("*Shophaghna*") first (Blood letting).

Sushruta significantly notes that blood as the

medium for spread of the disease, it ultimately tells about the importance of *Visravan* in the management of non-healing ulcers.

#### **"Visravan"**

It means evacuation or draining, which is one of the measures resorted to eradicate the imbalance of *Dosha*. In the case of non-healing ulcers, the *Visravan* stands for evacuation or drainage of blood i.e. blood letting.

#### **Indication:**

- Newly formed 'inflammatory swelling for alleviating pain.
- A wound which is indurated, marked by considerable swelling, inflammation, reddishness in colour, painful, deep and uneven.
- Poisonous wounds for treating pain and suppuration.

#### **Modern Medicinal Uses of Leech Therapy:**

Medicinal uses of leech therapy have principles owned from Greek theory of bodily function, which involve humors (good and bad) contained in the blood. Conditions such as inflammation and fevers were considered to result from bad humors. In the humoral theory, blood letting is required to drain these bad humors, so the use of leeches is represented on the aspects of the widespread practices of bloodletting.<sup>3,4</sup>

One of the principal modern uses of leeches is during the recovery from reconstructive surgery. As a matter of fact, Food and Drug Administration (FDA) has recently approved leech therapy as a medical device in United States of America.<sup>5</sup>

#### **Leeches in Wound Healing:**

The recalcitrant nature and complexity of chronic wounds continue to challenge health practitioners in the field, with many of the

standard treatment options often failing to provide good outcomes. Chronic wounds are often infected with bacteria resistant to antibiotics, compounding the problem. Some alternative biologic forms of treatment have been used and are gaining recognition; they include apitherapy (application of honey), maggots and leeches. In addition to other wound-healing actions, they all seem to show efficacy against bacteria, such as methicillin-resistant *Staphylococcus aureus* (MRSA).<sup>6</sup>

#### **MATERIAL & METHODS:**

Total 24 patients were selected randomly from the *Shalya* Out-Patient Department and some of them were referred to us from the different indoor wards of S.S. Hospital of Banaras Hindu University. The criteria of selection of the cases was based in the symptomatology presented by the patients according to the one described by the *Sushruta*.

Systemic examination and local examination of the wound were then done in detail. Its anatomical site, size, colour, margins, presence of discharge, associated pain, tenderness, depth and edema etc., were noted down and routine laboratory investigations were done.

After that the involved *Dosha*, *Adhithana* and the '*Dushya*' were determined based on the information collected.

Following the consent from the patient, two clinical groups were made according to the management to which patients subjected.

**Group A** Leech applied group with sterile dressing. (In big gangrenous wounds one time sharp debridement was done before leech application).

**Group B** Conservative wound management with drugs & dressings.

#### **Method of Leech Application:**

##### **Material**

- Two small glass or plastic jars, kidney tray, one big glass bowl, turmeric powder.
- Sterilized gauze, swab, and gloves.
- Sterile needle, sterile dispovan (10 ml).
- Normal saline and dressing material.

##### **Applying leeches:**

- First, we purified the leeches by putting them in the water mixed with turmeric for 15 minutes:
- After that leeches were kept in plain water for 5 minutes.
- Then patient's wound was cleaned thoroughly with plain water. If sterile water is available it is best suited for this purpose.
- Then the adequate numbers of leeches were applied to the general area of maximal congestion.
- Then a wet gauze or thin cotton pad was placed to cover the leech's body (head and mouth remained uncovered) and continuous pouring of fresh water was done. Once the leech attached, it will remain safely in that place until fully distended and then detached itself. (30-45 mm.)
- After that leeches were purified as the same manner described above and wound was cleaned with normal saline and then dressing was done.
- Same leeches were again applied to the same patient on the 4th and on 8th day.
- So three times leeches were applied to a single patient by dressing with normal saline.

##### **Parameter of assessment:**

Assessment of pain was done on zero, one and second week by following grading system:

- 0 – No pain
- 1 – Mild pain
- 2 – Moderate pain
- 3 – Severe pain

Observations were evaluated by using statistical calculations. Chi-square test was ap-

plied to test the significance of difference between proportions of two groups. Whenever the expected frequency came less than 5, Chi-square has been computed after suitably pooling the rows or columns.

**Observation and Results:**

**Table 2: Evaluation of pain**

Pain (0-3)	Grade	No. of patients			Chi-square test Intra group (BT Vs F <sub>2</sub> )
		Before treatment (BT)	First follow-up (F <sub>1</sub> )	Second follow-up (F <sub>2</sub> )	
Group I	0	2 (16.67)	5 (41.67)	12 (100.00)	$\chi^2 = 17.14$ <b>P&lt;0.001</b>
	1	0 (0.00)	6 (50.00)	0 (0.00)	
	2	2 (16.67)	1 (8.33)	0 (0.00)	
	3	8 (66.67)	0 (0.00)	0 (0.00)	
Group II	0	1 (8.33)	16.67	5 (41.67)	$\chi^2 = 10.97$ <b>P&lt;0.001</b>
	1	0 (0.00)	25.00	4 (33.33)	
	2	3 (25.00)	50.00	3 (25.00)	
	3	8 (66.67)	8.33	0 (0.00)	
<b>Chi square test Inter group</b>		$\chi^2 = 0.38$ <b>P&gt;0.05</b>	$\chi^2 = 1.82$ <b>P&gt;0.05</b>	$\chi^2 = 9.88$ <b>P&lt;0.01</b>	

**Comment**

**Intra-group**

In both groups statistically high significant improvement was seen after second follow up; however, in the leech applied group maximum number of patients (100%) had total relief of pain in comparison to the control group (41.67%).

**Inter-group**

Before treatment there was no significant difference in the presence of pain in both groups. In first follow up maximum number of patients (91.67%) had less pain in group I in comparison to group II (41.67%). However it was statistically not significant.

In second follow-up 100% patient had

no pain in leech applied group in comparison to 41,67% of control group and it was highly significant.

**DISCUSSION**

Charaka and Sushruta described leech application in the management of non-healing ulcers, skin disorders, gout, osteoarthritis etc. Keeping this in mind the present study was undertaken to review the use of leech application in the management of pain in non healing ulcers (*Jalauka Awacharan in Dustavrana*).

Following facts justify leech application in the management of pain in non-healing ulcers -

- Leech has hirudin in saliva which is a potent thrombolytic as well as fibrinolytic agent. It probably increases local circulation and thus diminishing inflammation and ultimately reducing pain.
- Leech has anti-biotic like substance, equally potent to penicillin and has potent anesthetic agent in saliva, which is equally potent to morphine (Aisha El awady, 2003).<sup>7</sup>
- Leech has a potent histamine like powerful vasodilator agent present in saliva (Karan & Dente, 2007)<sup>8</sup>, which acts as an anti-inflammatory and therefore reducing pain.
- Leech has Hyaluronidase, Proteinases, and Destabilase in saliva, which is probably helpful with enzymatic degradation of slough material present in non-healing ulcers and thereby reduces mechanical loads, which diminish pain. (Michalsen. A,2006)<sup>9</sup>
- After observing these facts, appropriate study model was prepared for treating non-healing wounds. To evaluate the response of leech application in non-healing ulcers, patients were divided in two groups randomly. On second follow up there was significant difference in intensity of pain and discharge was found. It could be because of the presence of an anesthetic agent, while it minimizes discharge by improving the oxygen concentration of wound tissue.
- Leech therapy improves the quality of life of patients by eradicating the pain and same time safeguard the patient from side effects which are associated with analgesics.

## SUMMARY AND CONCLUSION:

Leech application is significantly effective in pain management in the treatment of non-healing ulcers. Probably, the enzymes and other active compounds present in leech saliva play a major role in pain management. Further research work is still needed for evaluating and standardizing the different enzymes of leech's saliva individually, along with their effects on wound healing, it may open a new era of treating non-healing ulcers.

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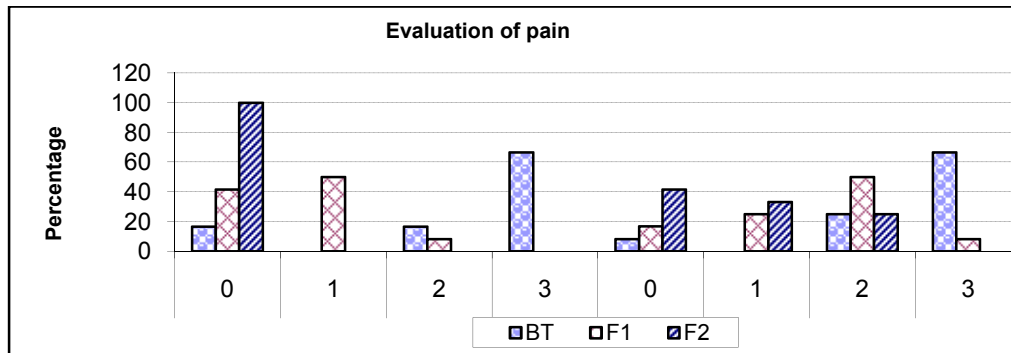
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Graph no.1

Source of support: Nil

Conflict of interest: None Declared