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EFFECT OF *SAPTAPARNA PICHU* IN *DUSHTA VRANA*

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Introduction

The problem of delayed wound healing has been dealt at various levels since the advent of humanity and even today. The pathological condition of wound may initiate due to the result of injury. The man suffered injuries through fall, fire, drowning and interpersonal conflict etc. Injury is the birth partner of man, for instance, the life of every individual starts with the healing of wound of the cut umbilical cord and so is its healing, which is naturally inbuilt in human body. But due to poor management or associated co-morbidities like diabetes, varicose vein, malnutrition etc., healing process get interfered and a chronic wound may result.

In the classical context, the formal descriptions of wound care are vividly elaborated in the three great treatises (*Brahattrayi*) of Ayurveda viz. *Charaka Samhita*, *Sushruta Samhita* and *Ashtanga Sangraha*. Description in *Brahattrayi* not only explain *Vrana* (various types of wounds), but they also depict systematic classification, along with their

management including various systemic and local drugs or preparations. *Acharya Sushruta*, the father of Indian surgery has elaborated the concept of *Vrana*. He gave description of various types of *Vrana* and also presented a descriptive etiopathogenesis of *Vrana* along with management.

Vrana has been described as *"Vranagatravichurnane Vranayatiti Vranah*".[1] "*Gatra"* means part of the body or tissue; "*Vichurnane*" means destruction, break or discontinuity. So, *Vrana* is defined as the destruction, break or discontinuity of the body tissue. *Saddyo Vrana* (traumatic wounds) depend upon the causative weapon or subject or mode of injury and it usually remains *Shuddha* (devoid of any contamination) up to seven days. But after seven days of occurrence, these wounds (*Saddyo Vrana*) may become *Dushta Vrana* (contaminated or unhealthy wounds) due to the imbalance of *Doshas* (body humours) and exhibit features of *Dushta Vrana*. The classical features of different types of *Vrana* are based on their shape, discharge, smell, pain & colour. If *Vrana* is ignored or not managed properly, then it can get converted into *Dushta Vrana,* i.e., Chronic wound.

A pathology in which there occurs destruction of body tissues and after healing, formation of scar takes place which persists for life time is known as *Vrana*.[2] According to modern aspect, a wound elicits inflammatory responses from the body which is both vascular and cellular. The vascular responses consist of transient vaso-constriction followed by sustained dilatation of arterioles, capillaries and venules. The cellular responses consist of swelling of histocytes and tissue macrophages, and emigration of leucocytes from vessels. The failure of this natural wound healing mechanism leads to chronicity of the wound. Several factors affect the natural process of wound healing such as the site of wound, contamination (foreign bodies/bacteria etc.), vascular insufficiency, previous radiation, etc. Systemic factors such as malnutrition, disease like diabetes mellitus, tuberculosis, immune deficiencies and medication like steroids are also responsible for delay in healing of the wound. All these factors interfere in the normal process of wound healing and may lead into a complex stage, viz. Chronic wound.

In *Ayurveda, Sushruta Samhita* basically deals with surgical diseases, in which a lot of descriptions are available regarding *Vrana* and its management. The basic aim of *Vrana*

management is to convert a *Dushta Vrana* into a *Suddha Vrana* after *Shodhna* and *Ropana* of *Vrana*. *Ayurveda* provides proper treatment with nil or minimal adverse effects along with other preventive measures to avoid recurrence. Moreover, it has become more significant in exploring effective formulations which possesses both *Vrana Shodhna* and *Vrana Ropana* properties. *Achraya Sushruta* has mentioned sixty measures *(Shasti Upakramas)* for the comprehensive management of *Vrana*, which includes various purification therapies for *Shodhana* and *Ropana*. Moreover, he advocated external application of various drugs under these categories. Among these, *Saptaparna* is one of the herbal plants specifically mentioned for *Dushta Vrana.* [3]

So, *Saptaparna Pichu* for *Shodana* and *Ropana* by local application was selected to study the healing of *Dushta-Vrana*.

MATERIALS AND METHOD

The study employed a single arm clinical trial design.

Ethics

After getting approval from the Ethical Committee (IEC approval letter No. UAU/RC/IEC/2021/1-53), the trial was registered in central trial registry–India (CTRI/2021/08/035685). Informed consent was obtained from all enrolled individuals on clinical trial.

Participants

Patients with classical features of the *Dushta Vrana* were selected randomly from the OPD/ IPD (not medical camps) of Department of *Shalya Tantra*, Rishikul Campus Hospital, UAU, Haridwar irrespective of sex, religion, occupation, etc. Total thirty (30) patients were selected for the study.

Inclusion Criteria

- All types of Chronic wounds
- All age groups, irrespective of gender
- Non–specific ulcers

• Infective post-operative wounds

• Non healing burn wounds

Exclusion Criteria

• Known patients of Malignant ulcers

• Tubercular ulcer

• Leprosy

• HIV, HBsAg, HCV, Suspected COVID-19 positive patients

• Underlying bony lesions

Withdrawal Criteria

• Personal matters

• Associated/intercurrent illness

• Aggravation of symptoms

• Leave against medical advice (LAMA)

• Other difficulties

Trial drug - *Saptaparna Pichu*

Collection of Drugs

Bark of *Saptaparna* was collected in its collecting period i.e., in between December to March from mature trees present in premises of Rishikul Ayurvedic College and Hospital, Haridwar.

Drug was identified and verified by Head of the *Dravya Guna* Department, Rishikul Ayurvedic College and Hospital, Haridwar.

Preparation of drug

Collected drug was cleaned with normal water and then dried in well ventilated room. Then the bark was converted to small pieces (*Yawakuta Choorna*). *Saptaparna* bark was soaked in 16 times of water. Then decoction was made by boiling until it remains to 1/8th of the initial

amount. This remaining decoction was filtered and boiled again till it become thicker in consistency. The final obtained thicker extract was *Raskriya.* [4]

Method of preparation of *Saptaparna Pichu*

Sterile Gauze piece of suitable size was fixed in a double layered wooden frame. Then, freshly prepared *Raskriya* was applied gently over the entire surface of gauze on both the sides with the help of a soft sterile brush (*Kurcha*) and allowed to dry in an oven fitted with ultra-violet light. Eleven coatings of *Saptaparna Raskriya* were done in similar manner.

After complete drying, the gauze i.e., *Saptaparna Pichu* was cut into desired shape & size, and then packed in a double secured airtight bag and sealed under aseptic precautions, which was ready for application in patients of *Dushta Vrana.*

Posology

Dushta Vrana was properly cleaned by sterile swabs and then area was dried by a sterile gauze piece. Devitalized tissue debridement was carried out in some cases as per the indication without using anaesthesia.

Saptaparna Pichu was applied over the wound surface according to the size of *Dushta Vrana*, over it a sterile gauze and pad was placed and bandaging was done.

Dressing was changed at every third day.

Assessment criteria

The criteria of assessment of cases of wounds were based on the symptomatology presented by the patients in accordance to description by *Acharya Sushruta* on *Dushta Vrana* (non-healing ulcers). This includes the **Subjective Parameter (**Pain, Itching) and **Objective Parameters** (Tenderness, Foul Smell, Floor/Granulation, Size, Discharge).

Grading for Assessment of Pain

0 - No pain

1 - Localized feeling of pain during movement only but no feeling during rest

2 - Localized feeling of pain even during rest but not disturbing the sleep

3 - Localized continuous feeling of pain, which disturbs sleep also

Grading for Assessment of Itching

0 - No Itching

1 - Slight and localized

2 - More and localized but not disturbs sleep

3 - Continuous itching disturbs sleep

Grading for assessment of Tenderness

0 - Tolerance to pressure

1 - Little response on slight pressure

2 - Wincing of face on slight touch

3 - Resists to touch

Grading for Smell

0 - No smell

1 - Little smell

2 - Unpleasant but tolerable

3 - Foul smell which is intolerable

Grading for Floor/Granulation

0 - Smooth, regular, healthy granulation tissue

1 - Smooth, irregular, with less granulation tissue

2 - Rough, irregular with moderate discharge, firm scar

3 - Rough, irregular with profuse discharge, hard scar

Grading for Discharge

0 - No discharge

1 - Scanty occasional discharge

2 - Often discharge

3 - Profuse continuous discharge

Grading for Size

0 - No discontinuity of skin

1 - Upto 5 cm

2 - More than 5cm but less than 10 cm

3 - More than 10 cm

Assessment Method

The overall improvement was assessed by the patient's sign and symptoms according to subjective and objective parameters.

It was done on every 15 days.

Observations

Out of Total Thirty (30) patients in this clinical trial total Seven (07) patients dropped out from study, so Twenty-Three (23) patients completed their clinical trial.

Majority of the patients were belonged to age group of 61-70 year (20%) followed by 31-40 year and >70-yearage group (16.5% each). Maximum patients were Male (76.7%). Majorly patients were belonging to Moderate Physical Work (60%). About 43.4% of patients have more than 2 Months of chronicity of *Dushta Vrana,* 33.3% have 1-2 month chronicity while 23.3% patient have chronicity lesser than 1 month. Maximum patients were not having any addiction (70.9%) and 12.9% were addicted to smoking. 80% of the patients had Single *Dushta Vrana* and in 20% patient *Dushta Vrana* was 2 in number. Based on the site 56.7%

patients have *Dushta Vrana* on Lower limb, 13.3% have on Upper limb and Gluteal region(each). About 66.7% of patients have size lesser than 5cm of *Dushta Vrana* and 33.3% patients have in between 5-10cm.

About 70% of patients falls under Grade-3 of **Pain**, 16.7 % in Grade-2, 6.7% Grade-1 and Grade-0 both. About 43.33% of patients complained of Grade-1 of **Itching**, 33.33% of Grade-3, 20% of Grade-2, 3.33% of Grade-0. About 73.33% of subjects complained of Grade-3 of **Tenderness**, 13.33% of Grade-2, 6.7% of Grade-1 and Grade-0 each. About 76.66% of subjects complained of Grade-3 of **Granulation**, 16.67% of Grade-2, 6.67% of Grade-1. About 40% of subjects complained of Grade-3 of **Smell**, 30% of Grade-2 and Grade-1 each. About 63.33% of subjects complained of Grade-3 of **Discharge**, 26.67% of Grade-2, 0% of Grade-1,10% of Grade-0. About 60% of subjects complained of Grade-1 of **Size**, 36.67% of Grade-2, 3.3% Grade-3 and 0% of Grade-0.

Results

Pain, Itching, tenderness, Granulation, Smell, Discharge and Size of *Dushta Vrana* showed statistically significant reduction following treatment [Table 1 and Table 2].

Table No.1- Subjective parameters –

	Median		Q1		Q3		Mean		Standard Deviation	Wilcoxon	P-Value	% Effect	Result
	BT	AT	BT	AT	BT	AT	BT	AT					
Pain	3.00	0.00	2.00	0.00	3.00	0.00	2.50	0.00	1.10	-406[a]	<0.001	89.33	HS
Itching	2.00	0.00	1.00	0.00	3.00	0.00	1.83	0.07	0.94	-435[a]	<0.001	96.06	HS

BT- Before treatment, AT- After Treatment, Q1- Quartile1, Q2-Quartile 2, HS-Highly Significant

Since observations were on ordinal scale (gradations), Wilcoxon Signed Rank Test was used to test efficacy. On calculating the above mentioned values, it was observed that, P-Value for

all parameters was less than 0.001. Hence, it was concluded that, effect observed in all parameters was highly significant.

Table No.2- Objective parameters –

	Median		Q1		Q3		Mean		Standard Deviation	Wilcoxon	P-Value	% Effect	Result
	BT	AT	BT	AT	BT	AT	BT	AT					
Tenderness	3.00	0.00	2.00	0.00	3.00	0.00	2.53	0.20	1.09	-402[a]	<0.001	92.11	HS
Smell	2.00	0.00	1.00	0.00	3.00	0.00	2.10	0.13	0.89	-435[a]	<0.001	93.65	HS
Granulation	3.00	0.00	3.00	0.00	3.00	0.00	2.70	0.17	0.78	-435[a]	<0.001	93.83	HS
Discharge	3.00	0.00	2.00	0.00	3.00	0.00	2.43	0.30	1.13	-364[a]	<0.001	87.67	HS
Size	1.00	0.00	1.00	0.00	2.00	1.00	1.43	0.47	0.89	-282[a]	<0.001	67.44	HS

BT- Before treatment, AT- After Treatment, Q1- Quartile1, Q2-Quartile 2, HS-Highly Significant

Since observations were on ordinal scale (gradations), Wilcoxon Signed Rank Test was used to test efficacy. On calculating the above mentioned values, it was observe that, P-Value for all parameters was less than 0.001. Hence, it was conclude that, effect observed in all parameters was highly significant.

Discussion

Pain-

Considering the mode of action by *Rasa* (*Tikta* and *Kashaya*) [5], *Saptaparna* must have been *Vatakara* and hence increase the *Ruja* (pain) which is predominantly due to *Vata*. But the effect of the drug on *Ruja* is found to be highly significant. This might be due to the action of the *Virya* (Potency). Having *Ushna* (Warm) *Virya* is supposed to be *Vatahara* and thus might

have decreased *Ruja*.[6] Moreover, the main three alkaloids viz. Picrinine, Vallesamine and Scholaricine, produce the anti-inflammatory property. It acts by inhibiting the inflammatory mediators (COX-1, COX-2 and 5-LOX) which are responsible the inflammation in a wound and thus reducing the pain. [7]

Itching –

Saptaparna has *Tikta, Kshaya rasa, Laghu* and *Snigdha guna*, and *Ushna virya* with *Katu Vipaka*. [8] All these properties have *Kanduhar* effect as it helps to reduce vitiated *Kapha,* which is responsible to cause *Kandu* in *Dushta Vrana*. The aqueous extracts of *Saptaparna* shows varying degrees of inhibitory activity against all bacteria especially against Gram positive and Gram-negative bacteria, thus helpful in reducing Itching of *Dushta-Vrana*. [9]

Tenderness –

Saptaparna has *Ushna virya*,[10] which helps to pacify the *Vata Dosha*, thus relieving Pain as there is no pain without *Vata*. Similar alkaloids viz. Picrinine, Vallesamine and Scholaricine which help in subsiding pain. [11]

Foul smell –

Saptaparna, due to the presence of *Tikta, Kashaya rasa,* [12] *Krimighna* action occurs which helped to control the local infection and therefore, the bad odour of *Dushta-Vrana.* Phytochemical investigation of aqueous extract of *Saptaparna* bark were found to possess significant antibiotic activity against all types of bacteria and therefore it must be helping in reduction of foul odour of *Dushta Vrana*[13].

Floor/ Granulation –

Saptaparna due to the presence of ***Tikta, Kashaya rasa and Laghu Guna*** helps in *Shodana* therefore removes slough and cleans the wound floor. ***Katu rasa*** removes *Srotorodha* due *Deepana-Pachana* property [14] and provides better circulation to *Vrana*, resulting in healthy granulation tissue formation. The aqueous extract of the bark of *Saptaparna,* showed highest antioxidant activity among the other extracts. Oxidation process hampers the wound healing; antioxidants protect the tissue from the oxidative damage and helps in healthy granulation tissue formation. [15]

Size –

Due to *Kashaya rasa*, *Sandhaniya* property is present in *Saptaparna*. *Sandhan* karma is helpful in *Peedana* (contraction of *Vrana*) *Ropana* (heal) and *Shodhana* (curative effect) property.[16] *Saptaparna* is *Snigdha* in nature and hence helps in *Dhatuvardhana & Dhatuposhana* which is essential for *Vrana* contraction and maintaining minimal scar.[17]

Discharge –

Shoshna, Lekhana, Stambhana, Puyapshodhana properties are due to *Tikta, Kashaya rasa* and *Laghu guna* of *Saptaparna* which are essential for scraping of debris and reducing of discharge. *Kshaya rasa* also must be *Atitwak Prasadaka* (cleanses the skin and removes all the dirt from here).[18] Due to all these properties, it must have reduced the *Srava* (discharge). Phytochemical investigation of aqueous extract of *Saptaparna* bark is found to possess significant antibiotic activity against all types of bacteria and it reduced discharge of *Dushta Vrana.* [19]

Pharmacodynamic properties of *Saptaparna* [20]:

Table No.3-

Rasa	*Tikta*, *Kashaya*
Guna	*Laghu*, *Snigdha*
Veerya	*Ushna*
Vipaka	*Katu*
Dosha karma	*Tridosha-Shamak*
Part used	Bark

Note: -A peculiar property of *Saptaparna* is worth mentioning. Usually herbs with *Laghu Guna* are *Ruksha* (e.g., *Lodhra*) and the herbs that are *Snigdha* are usually *Guru* in nature, (e.g., Sesame oil). But this is a rare herb having combination of *Snigdha* (oiliness) and *Laghu* (lightness).

Conclusion

Hence, it can be concluded that ***Saptaparna Pichu*** has very satisfying positive results in subjective as well as objective parameters of all patients of *Dushta Vrana*.

There is an authentic reference available regarding *Saptaparna* in the management of *Dushta Vrana* in *Sushruta Samhita. Saptaparna* possess excellent qualities like *Shodhana*, *Ropana, Vedana-sthapana, Shoth-har, Lekhana, Shoshana,* etc. which helps in effective management of *Dushta Vrana*. Also, in statistical analysis, *Saptaparna pichu* showed highly significant result. Moreover, this therapy was found to be very cost effective, can be easily prepared and shows no side effects in *Dushta vrana* management. It is worth mentioning that even after follow up period, patients come for routine check-up at our *Shalya* OPD, and no sign of recurrence has been observed.

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