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A randomized controlled clinical study to evaluate the Wound Healing Activity of *Durvadi Ghrita* in Clean Wounds w.s.r. to *Shuddha Vrana*

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ABSTRACT

Introduction: The wound which is referred as *Vrana* is the oldest ailment from which the humankind has suffered. Man has made every effort to deal with the problems caused by trauma since the dawn of civilization. A thorough analysis of the *Ayurvedic* classics revealed that *Durva* is one of the medications with wound-healing capabilities. **Objective:** To evaluate the wound healing activity of *Durvadi Ghrita* in Clean wounds. **Methodology:** A single blind clinical study with pre-test and post-test design. The 30 patients with diagnostic criteria of *Shuddha Vrana* were selected from R.G.G.P.G. *Ayurvedic* College, *Paprola*, District Kangra, Himachal Pradesh. In Group A, the wound is dressed with Povidone Iodine. In the group B, *Durvadi Ghrita* was used for dressing. Wound management done once in a day. Duration of the study was 28 days. Follow up done once in 7 days for 1 month. The data were graded based on the assessment criteria and were analysed statistically. **Results:** The outcome of the treatment after 28 days showed high statistical significance in parameters like color (*Vrana*), wound bed, surrounding skin, type and amount of discharge from the wound and pain. **Conclusion:** Both these treatments showed reduction in symptoms but Group B in which *Durvadi Ghrita* was used showed better results. It can be concluded that *Durvadi Ghrita* is very effective in the management of *Shuddha Vrana* when compared to Povidone Iodine.

Key words: *Ayurveda*, *Vrana*, *Povidone Iodine*, *Durvadi Ghrita*, *Shuddha Vrana*

INTRODUCTION

Our skin is critical to our existence because it senses the environment, regulates our body's physiology and temperature, serves as a storehouse for vital nutrients, offers both passive and active defense, and reacts to trauma and injury. *Ayurveda*, the Indian traditional

System of medicine, is based on empirical knowledge of the observations and the experience over millennia. *Acharya Sushruta* an ancient Indian Surgeon has described *Vrana* as one of the main subjects in his treatise *Sushruta Samhita*. He has described *Vrana* from its different aspects, right from definition, causes, etio-pathogenesis, till the management of its scar tissue formation. *Vrana* is seen as a disabling and scarring condition that can affect people of any age. In modern texts, wound is said to occur when integrity of any tissue is compromised. The care of *Vrana*, which develops either as a result of vitiated *Doshas* (*Nija Vrana*) or as a result of trauma (*Agantuja Vrana*), has been emphasized numerous times in the classics of *Ayurveda*. As every surgical procedure starts with the formation of a wound and ends with its healing. The knowledge of its effective management for a surgeon is the basic required skill on which the outcome of surgery revolves. Wound healing is a complex and

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dynamic process. The knowledge of the physiology of the normal wound healing trajectory through the phases of hemostasis, inflammation, granulation and maturation provides a framework for an understanding of the basic principles of wound healing. Healing of wound is a challenging task to surgeon in ancient time and even in today's era. Proper healing of wounds is essential for the restoration of disrupted anatomical continuity and disturbed functional status of the skin. In *Ayurveda*, the management of wounds has been divided in three phases such as *Vranashodhana* (clearing and debridement), *Vranaropna* (wound/ulcer healing) and *Vaikritapaham* (eradication of various structural and cosmetic defects) (*Su.Su.17/22-23*). However, wound healing alone was not the end goal; the aim was to return the area to its pre-injury appearance in terms of colour, surface, hairs, and other elements. Keeping this fact in mind *Acharya Sushruta* has described *Shashti Upakrama*^[1] (60 measures) for the management and proper healing of the *Vrana* (wounds), starting with an aseptic dressing of the affected part and ending with the rehabilitation of the normal structure and function. These therapeutic measures were aimed not only to accelerate the healing process but also to maintain the quality and aesthetics of the healing. In *Ayurveda* there are so many pieces of pearl available to treat wound without any complication. A thorough analysis of the *Ayurvedic* classics revealed that *Durva* is one of the medications with wound-healing capabilities. *Durva* is familiar since *Vedic kala* to the present era and almost available in all corners of the world. One of its topical formulations which is mentioned in various treatise is *Durvadi Ghrita* and its importance in Wound healing is known from the fact that it is mentioned in every major treatise. It is described in, *Charaka Samhita*, *Sushruta Samhita*, *Ashtang Hridaya*, *Chakkardutt* and also in *Bhaisjya Ratnavali*. *Durva Ghrita* is herbal formulation containing *Durva*, *Ghrita*, *Daruharidra*, *Kampillaka* as its constituents.

MATERIALS AND METHODS

Source of data

The patients with clean wounds, post-operative and non-infected wounds were selected from OPD and IPD

of R.G.G.P.G. *Ayurvedic* College, *Paprola*. All the Ingredients were procured from the authorized dealer of the raw herbs. Procured drugs were identified and certified by the P.G. Deptt. of *Dravya Guna* of R.G.G.P.G. *Ayurvedic* College, *Paprola*, District Kangra. Drug preparation (*Durvadi Ghrita*) was carried out at *Charak Ayurvedic Pharmacy* of R.G.G.P.G. *Ayurvedic* College, *Paprola*, District Kangra, under the direct supervision of P.G. Deptt. of *Rasa Shastra* and *Bhaishajya Kalpana*.

Ethical clearance no.- IEC/2021/1269

CTRI no. - CTRI/2023/01/048970

Method of collection of data:

The patients with clean wounds were screened under strict diagnostic, inclusion and exclusion criteria and were selected for the study. Eligible subjects were invited to participate in the study after signing a detailed informed consent and registered for this clinical trial. A randomized controlled clinical study in comparison with a control group will be done on 30 patients selected as per the criteria mentioned in assessment criteria. The patients enrolled in the study will be divided into two i.e Group- A which is Control group and Group B which is Study group, each comprising of 15 patients each. The signs and symptoms and other parameters, as per the assessment criteria mentioned will be observed before and after the treatment and the results of the two groups will be compared, analysed statistically and discussed.

Design of the study: An Open labelled, randomized, comparative, interventional clinical study

Inclusion Criteria

Patients of either sex between 20-70 years of age and having the sign and symptoms of *Shuddha Vrana* were included in the study.

Exclusion Criteria

Patients suffering from *Dusta Vrana* (non healing wounds), wounds associated with systemic diseases like Diabetes mellitus, Tuberculosis, Malignant wounds, Arterial and Varicose ulcer, Pressure ulcer,

Immunocompromised patients with pre-diagnosed HIV and hepatitis B.

Investigations

The following Investigation is undertaken to estimate the patient's general health condition and also will assist in determining the severity of infection.

Laboratory tests: HB%, RBC, TC, DC, ESR, RBS, HbA1C, HIV, HBsAg. Any other investigations (if necessary).

Assessment Criteria

Subjective Parameters

1. *Varna* (color)
2. Wound bed
3. Surrounding skin
4. *Srava* (Type of discharge)
5. Amount of discharge
6. *Vedna* (Pain)

Objective Parameters

Bates-Jensen Wound Assessment Tool

Intervention

Study Group

The wound was examined, exudates, debris, slough was removed if present, the surrounding area was cleaned. A gauze soaked in *Durvadi Ghrita* was placed and wound dressing was done once in a day. The patient was educated to do the same for 28 days. The duration of study was 28 days or till wound healing whichever is earlier.

Control Group

The wound was examined, exudates, debris, slough was removed if present, the surrounding area was cleaned, a gauze soaked in Povidone Iodine was placed and wound dressing was done once in a day. The patient was educated to do the same for 28 days. The duration of study was 28 days or till the wound heals whichever is earlier.

Duration of the study

Wound management was done once in a day and duration of study was 28 days or till the wound heals whichever is earlier.

Follow-up

The patient was followed up on the 7th, 14th, 21st, 28th days during the course of treatment and after that follow-up was done on the 45th day.

Statistical analysis

Statistical analysis was done on Sigma Plot software version 14.0. In this study Wilcoxon Signed Rank test was taken in place of paired t test when data is ordinal, where distribution is not normal or sample size is small. For the analysis in between group, Mann Whitney test is used for ordinal data, when distribution is not normal or small sample size.

Photographs of Trial group

Case 1



Wound on 1st day



Wound after 7 days



Wound after 14days

Case-2



Wound on 1stday



Wound after 7 days



Wound after 21 days

OBSERVATIONS AND RESULTS

A. Effect on Varna

In Group A mean score of *Varna* before treatment was 2.067 which reduced to 0.4 after treatment with the percentage of relief 80.7% which was statistically highly significant ($p < 0.001$).

In Group B mean score of *Varna* before treatment was 2.067 which reduced to 0.066 after treatment with the percentage of relief 96.7 % which was statistically highly significant ($p < 0.001$).

Intergroup comparison showed that difference between percentage of relief of group A and group B was 16 % and was statistically significant ($p < 0.05$).

B. Effect on Wound bed

In Group A mean score of wound bed before treatment was 3.733 which reduced to 0.4 after treatment with the percentage of relief 89.28. % which was statistically highly significant ($p < 0.001$).

In Group B mean score of wound bed before treatment was 3.8 which reduced to 00 after treatment with the percentage of relief 100 % which was statistically highly significant ($p < 0.001$).

Intergroup comparison showed that difference between percentage of relief of group A and group B was 10.72 % and was statistically significant ($p < 0.05$).

C. Effect on Surrounding skin

In Group A mean score of surrounding skin before treatment was 0.933 which reduced to 0.133 after

treatment with the percentage of relief 85.75% which was statistically significant ($p < 0.05$)

In Group B mean score of surrounding skin before treatment was 1.2 which reduced to 0 after treatment with the percentage of relief 100 % which was statistically significant ($p < 0.05$).

Intergroup comparison showed that difference between percentage of relief of group A and group B was 14.25% and was statistically non-significant ($p > 0.05$).

D. Effect on type of Discharge

In Group A mean score of discharge before treatment was 1.333 which reduced to 0.133 after treatment with the percentage of relief 90 % which was highly significant ($p < 0.001$)

In Group B mean score of discharge before treatment was 1.4 which reduced to 0 after treatment with the percentage of relief 100 % which was statistically highly significant ($p < 0.001$)

Intergroup comparison showed that difference between percentage of relief of group A and group B was 10 % and was statistically non-significant ($p > 0.05$).

E. Effect on Amount of discharge

In Group A mean score of amounts of discharge before treatment was 0.867 which reduced to 0.200 after treatment with the percentage of relief 76.9 % which was significant ($p < 0.05$)

In Group B mean score of amounts of discharge before treatment was 1.0 which reduced to 0 after treatment with the percentage of relief 100 % which was statistically highly significant ($p < 0.001$)

Intergroup comparison showed that difference between percentage of relief of group A and group B was 23.1 % and was statistically non significant ($p > 0.05$).

F. Effect on Vedna

In Group I mean score of *Vedna* before treatment was 2.2 which reduced to 0.4 after treatment with the percentage of relief 81.81 % which was highly significant ($p < 0.001$) In

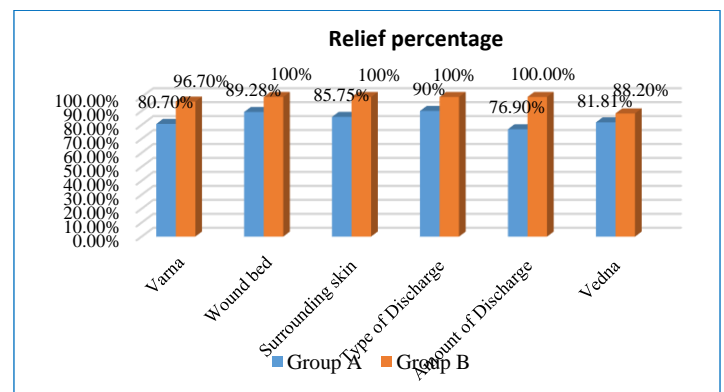
Group II mean score of *Vedna* before treatment was 2.267 which reduced to 0.267 after treatment with the percentage of relief 88.2 % which was statistically highly significant ($p < 0.001$)

Intergroup comparison showed that difference between percentage of relief of group A and group B was 6.39 % and was statistically non-significant ($p > 0.05$).

Result summary of subjective and objective parameters

Parameters	Mean score BT		Mean score AT			
	Group A	Group B	Group A	%	Group B	%
Varna	2.067	2.067	0.4	80.7%	0.066	96.7%
Wound bed	3.733	3.8	0.400	89.28%	00	100 %
Surroundin g skin	0.933	1.2	0.133	85.75%	00	100 %
Type of discharge	1.333	1.4	0.133	90%	00	100 %
Amount of discharge	0.867	1.0	0.200	76.9%	00	100 %
Vedna	2.2	2.267	0.4	81.81%	0.267	88.2 %

Summary of Relief Percentage of parameters



Total effect of therapy

In the present study overall 76.67 % patients i.e., 23 patients were cured (completely healed wound), 23.33% patients i.e., 7 patients were markedly

improved (partially healed wound with well defined granulation tissue)

DISCUSSION

Durva^[2] is having *Kashaya* and *Madhura Rasa* as well as *Madhura Vipaka*. Therefore, it provides nourishment to skin and all *Dhatus*. It possesses *Vrana Ropana* and *Vishaghna* properties also; therefore, it helps to remove microbes and cleans the wound. It has the properties of *Daha Prashamana*, hence it creates cool effect in burning sensation and checks it. It is *Stambhana* and *Raktashodhaka* also therefore it checks bleeding and discharge from wounds and shows haemostatic action very well.

Kampillaka is well known anthelmintic, antibacterial,^[3] antifungal, and vermifuge. It is reported as *Vrana Shodhaka* and *Vrana Ropaka* as well as *Krimighna*.^[4] Due to these properties it checks bacteria, fungus from the wounds and helps it for proper healing.

Daruharidra^[5] is having *Tikta*, *Kashaya Rasa* and *Ushna Virya*. It has been proved that *Daruharidra* has *Shothahara*, *Raktashodhaka* and *Raktastambhana* properties. Hence it reduces inflammation and makes blood free from various microbes. Due to *Vedana Sthapana* property, it provides better relief in pain and tenderness. It is *Varnya*, so it provides a natural colour to scars.

Hence drugs of *Durvadi Ghrita* have analgesic, antimicrobial,^[6] anti-inflammatory and anti-oxidant properties by which it helps in preventing wound from getting infected and thus promote wound healing.^[7]

On the other hand, Povidone-iodide (Betadine) is an antiseptic that kills or slows the growth of infection causing microorganisms. So, it has no such role in wound healing as compared to *Durvadi Ghrita*.

CONCLUSION

Wound healing is multi-factorial complex phenomenon, which is still remains obscure in many areas. Although healing is a natural process but every attempt should be taken to ensure that a clean wound is free of anything that could impede the healing process. Though, the role of certain medications like

various medicated *Tail*, *Ghrita*, *Lepa* etc. are established for their efficacy in fastening, strengthening the wound better than conventional management. The present study showed that local application of *Durvadi Ghrita* on clean wounds possesses sufficient efficacy in preventing infection and enhancing wound healing.^[8] Ointment form of application was easier and has showed its efficacy in all the selected parameters of the Bates Jensen wound assessment tool.

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