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RATIONALITY BEHIND THE USE OF COLLOIDS AND EMULSIONS IN WOUND MANAGEMENT *W.S.R.* SHATADHOUTAGHRTA AND SARJARASAMALAHAR - A REVIEW ARTICLE

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ABSTRACT

A wound is a break in the integrity of skin or any tissue which may be associated with disruption of structure and function. Wound healing refers to repair of damaged cells and scar formation. This complex healing process can be hampered by several factors like excessive discharge, dry ulcer floor, excess non-viable tissue covering the wounds, inflammatory conditions, infection, any underlying systemic pathology etc. So proper dressing should be done accordingly to accelerate the healing process. The objective of successful wound management is to achieve a clean wound bed, protect the wound bed, prevent and eliminate infection and provide an optimal wound healing environment. *Shathadhoutaghrta* and *Sarjarasamalahar* are two such Ayurvedic drugs which are very commonly used in wound management. This presentation is an attempt to evaluate the mode of action of these two Ayurvedic drugs in wound management and to understand the rationality behind the formulation and usage of these two drugs.

Key words : Wound, Emulsions, Colloids, *Shatadhouta ghrita, Sarjarasa malahar*

INTRODUCTION: The skin serves as a barrier to keep the body safe from environmental harm, pathogens, and dehydration. In addition, it produces vitamin D, acts as a sensory organ, and regulates body temperature. The skin is composed of three layers: the hypodermis, dermis, and epidermis. The proliferation process occurs in five distinct strata, ranging from the basal to the stratum corneum. A wound is a break in the skin's or any tissue's integrity that could result in an alteration of its structure or function. They can be classified as either acute or chronic. Chronic wounds confront a significant medical challenge because of altered wound environment and difficult-healing circumstances.

NIRUKTI:

Vrana Gatra Vichoornane Vranayati Iti Vrana[1]

The tissue destruction or damage of body part is termed as *Vrana.*

Vranyati iti Gatra Vaivarnya Karotii Itiartha[2]

The one which gives discoloration at its site is called as *Vrana.*

DEFINITION:

Vranoti yasmaat roodhe api vranavastu na nasyati !
Aadeha dharanaat tasmat vrana ityuchyate budheh !![3]

Vrana (wound) is so called because it covers the destructed site and even after complete healing the scar remains for the life time.

CLASSIFICATION OF *VRANA*:

Vrana can be classified into different categories

1. Based on etiology[4] : a) *Nija Vrana b) Agantuja Vrana* (Traumatic wound)
2. Based on the nature of wound[5] :

a) *Shuddha Vrana* (clean and healing ulcer) b) *Dushta Vrana* (non healing ulcer) c*) Ruhyamana Vrana* (healing stage of ulcer) d) *Roodha/ Rohit Vrana* (healed ulcer)

3. Based on *Saadhyasaadhyata*[6]-

(a) Sukhasaadhya (b) Kruchrasaadhya (c) Yaapya (d) Asaadhya

4. Based on the *vrana vasthu*[7] involved they can be- *Twak, Mamsa, Sira Snayu, Sandhi, Asthi, Koshta and Marmaja vranas.*

WOUND HEALING:

The process of repairing damaged cells through scar formation is known as wound healing. Blood cells, extracellular matrix, and epidermal cells are all involved in wound healing. The four stages of hemostasis ,inflammation, proliferation, and remodeling are among its complicated and dynamic phases[8].

While "magical dressings" do not exist, they are a significant component that not only treats the underlying problem but also aids in wound healing. Any clinician can make decisions about which product to use and when by evaluating the wound bed, infection status, depth of injury, drainage, and wound location

The treatment of wounds is always changing in accordance with medical advancements. Doctors continue to search for the perfect dressing material despite several obstacles. Owing to the rise of multi-resistant bacteria and decrease of new antibiotic options, wound care practitioners are turning back time to the past by incorporating complementary and alternative medicine into wound care practices. The improvement in people's perceptions of traditional medicine is incredibly encouraging. Additionally, traditional medicine has embraced the well accepted concept of moist wound healing. which speeds up the healing process. Numerous research on the management of wounds using herbal and traditional medicine from several continents have been published.

Negative pressure therapies, scaffolds, hydrocolloid dressings, foams, emulsions and biomembranes are examples of current allopathic treatment[9].

MATERIALS:

Emulsions: Emulsions have become more popular among therapy techniques for wound closure. Both aqueous and oleaginous substances can be encapsulated in these adaptable formulations, and their rheological characteristics can be precisely adjusted.

Topical therapies frequently employ oil-in-water (O/W) emulsions to blend hydrophilic and hydrophobic ingredients in one formulation. The two active components combined are intended to maximize their individual advantages. Consequently, these emulsions are widely used in the pharmaceutical business to give lotions hydrating qualities without making them sticky. These emulsions can also contain a wide variety of components, including naturally occurring materials like essential oils that have been isolated from plants like Allium sativum, Zingiber officinale, Melaleuca alternifolia, Rosmarinus officinalis, and Thymus vulgaris. They also contain other regularly used medicines for wound closure, like dexpanthenol and silver sulfadiazine, as

well as antibacterial peptides for wound infections.

Colloids :

A mixture in which one material is suspended throughout another that contains insoluble particles that are microscopically dispersed is called a colloid. Certain definitions stipulate that the particles must be distributed within a liquid, while others broaden the definition to encompass materials such as gels and aerosols. Colloids are mixtures where one component (the continuous phase) is finely distributed throughout another (the scattered phase) [10].

When it comes to wound treatment, colloids can be used as gels or dressings.

Benefits:

Moisture Retention: Colloids facilitate the preservation of a moist wound environment, thereby promoting healing and preventing tissue dehydration.

Exudate Absorption: They can absorb wound exudate (fluid) while retaining their gel-like consistency.

Conformability: Colloids adapt to the contours of the wound, improving coverage.

Pain Reduction: Certain colloids possess cooling properties that alleviate pain and discomfort.

Shatadhoutaghrta

It is a perfect example of Ayurvedic emulsion and is composed of *ghrita* imbibed with water.

Shatadhouta ghrtam kli /

Yat punah punah santaapya sheetabhyasa nirvapyate tadhavidha sarpishi /

Shatam vaareen sheetatoyena dhoutam phenitam ghritam iti eeshanadevaha //

Tad gunaah vatapittadahakshatanaashitwam //

Athava shatadhoutena sarpisha kshirajena va /[11]

Revitalizes Dermal Tissue: By revitalizing dermal tissue, *Shatadhouta ghrita* aids in the healing of damaged skin.

Pain Relief: It eases irritated skin-related pain.

Anti-Inflammatory: Capable of bringing down inflammation.

Hydrating

Trituration causes a w/o kind of emulsion to occur because the lipid phase (cow ghee) is a significant phase. The pressure used during trituration causes the fat granules' particle size to decrease as the washing process goes on. After a series of washings, the aqueous phase eventually overtakes the lipid phase. Phase inversion occurs as a result, producing an o/w kind of emulsion. There's a chance that might lead to a complicated system like w/o/w emulsion. Cow ghee's distinctive smell and granular, oily consistency are eliminated in SDG, resulting in a smooth, uniform, and non-oily product that is simpler to use and increases patient compliance. A higher moisture content may help hydrate and cool the skin, which makes it advantageous to avoid skin irritation.

Sarjarasamalahar[12,13]

Sarjarasa is the oleoresin obtained from tree SALA, Shorea robusta of family Dipterocarpaceae. It is well known for its potent wound healing property and can be used successfully in the management of *vrana, dusta vrana, vipadika, kushtha, vranasotha* etc[14]

Method of Preparation[15]:

Method. 1

Table no-1 ingredients of *Sarjarasamalahar*

S.no.	ingredients	Quantity
1	*Sarjarasa (Shorea robusta)*	4 parts
2	*Tilataila (Sesamum indicum)*	16 parts
3	*Tuttha (Copper Sulphate)*	1 part
4	*Jala (water)*	QS

Oil is heated over a low flame until vapors start to form. When vapors start to form, the heating is halted, and gradually added and stirred are fine powders of *Sarjarasa and Tuttha* (Copper Sulphate) repeatedly till they dissolve. The mixture is then filtered over a plate and rubbed by hands with a gradual addition of water before cooling. When the melted mixture is rubbed, the additional water is absorbed. The addition and rubbing is continued till the absorption of water stops. This shows that the process is finished and that a fine ointment that resembles butter has been produced. This is called as *Sarjarasa Malahara*. It is kept in containers with a large opening and water at the neck. Regular water changes are necessary to preserve the *malahara* in good condition

Method. 2. Table no-2 ingredients of *Sarjarasamalahar*

s.no.	ingredients	Quantity
1	*Sarjarasa (Shorea robusta)*	4 parts
2	*Tilataila (Sesamum indicum)*	16 parts
3	*Tuttha (Copper Sulphate)*	1 part
4	*Spatika (Alum)*	1 part
5	*Jala (Water)*	QS

The process is the same as described above up until heating and powder addition, but after filtering, the mixture is placed in a water-filled vessel and rubbed with hands. Rubbing is continued and the water is changed until all of the extra *Tuttha (*copper sulphate) has been removed (i.e., the washing water does not change color). Ultimately, a butter-like, finely white ointment is produced, which needs to be preserved as previously indicated. The ointment made using this approach is whiter than the one made above since all of the *Tuttha* is removed by the water. Thus it is more suitable for the name *Shweta Malahara.* Both the processes result in an emulsion which is less stable when exposed to environment and this defect makes the product difficult to be marketed.

Some authors also opine *rasakarpoora* as ingredient in *sarjarasa malahar*

DISCUSSION: *Ghrita (ghee)* have *Preenana* property because of which, it can cause *Dhatu Vardhana*. As the drug has *Snigdha Guna* (unctuous property), it helps to pacify *Vata*, which vitiates very quickly in *Sadyo Vrana*[16] (Acute wound). Due to its *Sheeta Guna* (cooling property), it helps in normalizing vitiated *Pitta*, thus helps in pacifying *Daha*(burning sensation). As the drug helps in *Poshana* (nourishment); leads to healthy scar formation and due to its *Twakvarna*

prasadana property and causes *Savarnikarana.* Processing Ghee for 100 times with water impregnate qualities of *Jala Mahabhuta,* through which cooling effect can be expected. This also helps in reducing burning sensation. Because *Shatadhauta ghrita* has a neutral pH, it is less inflammatory to the skin than ghee, which has an acidic pH. *Shatadhauta ghrita's* smaller particle size contributes to the product's non-granular, non-sticky, and homogenous texture, which facilitates easy application to the skin and may speed up the rate of absorption through the skin. A homogenous oil-in-water emulsion with improved consistency and viscosity is produced after washing, making it appropriate for topical applications[17].

Sarjarasa is explained by Acharya Charaka under *Vednasthapaka Gana. Sarjarasa Malahara* was described to be utilized in *Vrana, Daha, Arsha, and Gudpaka*. Phytochemical screening of the shorea robusta oleoresin revealed the presence of various chemical constituents like alkaloids, tannins, flavonoids triterpenoids, proteins, resins, saponins and steroids etc. *Sarjarasa* synonymously called as *Rala* has dominantly *kashaya rasa* which is responsible for wound contraction. It contains triterpenoids assembled from a C5 isoprene unit through the cytosolic mevalonate pathway to make a C30 compound which is steroidal in nature and hence it reduces pain[18]. It contains tannins and can act as haemostatic and effective in hemorrhage. *"Shita" guna*, of *Shala niryasa* reduces the burning sensation. The *"Kandughana"* property helps in relieving the itching sensation, also known as *Kandu. Shorea robusta's* oleoresin is a good source of antioxidants[19].

Tuttha (Copper sulphate) is classified under *Maharasa* in *Rasashashtra.* It is *kapha-pittahara, lekhaniya* and *krimighna* in action and thus helps reducing edema and infection at local vrana site , also due to *lekhaniya guna (*scraping property) its helps to remove the cell debris at local vrana site[20].

Sphatika (Alum) is classified under *Uparasa* in *Rasashashtra* . It is *kashaya rasa pradhana* and has *Vishanashaka* (antitoxic), haemostatic properties by which it help the cure of wound and prevent infection[21]

Tiltaila is *Vatashamak* due to its *madhur rasa, ushna virya and snigdha guna*. So it reduces pain which is predominant symptom of *Vata.*

CONCLUSION: By sustaining the ideal healing environment and promoting tissue repair, colloids and emulsions both aid in the efficient management of wounds and it can be said that *shatadhoutaghrita* and *sarjarasamalahar* are beneficial for wound care given all of their characteristics. Based on their preparation methods, we can categorize them as colloids and emulsions. By assessing the properties of the individual ingredients in both formulations, it can be concluded that they possess strong wound healing properties. This enables us to evaluate the degree of expertise our Acharyas held and the accuracy with which they articulated the qualities and applications of preparation. Many of the formulations found in our samhitas can also be connected to contemporary knowledge for a richer comprehension. If we have a basic understanding of the formulation, we can also improve these medications by adding our own components based on the patient's condition and the state of the disease.

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