

Formulation & Evaluation of Herbal Wound Healing Cream

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Abstract— The main goal of present research was to formulate and evaluate the wound healing activity of cream which were prepared from herbal plant. Herbal medicines has become a global important for both medical and economical. The wound healing cream are prepared from herbal plant are more efficacious than synthetic medicines and which shows some adverse effect. Although uses of herbal plants instead of systemic medicines which have ability to improve the quality, efficacy and safety of the cream. This study investigated the wound healing activity of “Azadirachta indica” (Neem) and “Ocimum sanctum” (Tulsi) to the wound. The two plant which are selected for the preparation of wound healing cream which itself have antimicrobial and anti-inflammatory activity.

Keywords: Wound Healing Cream Formulation, Evaluation, Tulsi, Neem, Antimicrobial Activity

I. INTRODUCTION

Wound is an injury of external breakdown of normal continuity of extracellular matrix and epithelium wound are occur when the surrounding tissue are damage.[1] The wound can be produced by physical, chemical, thermal and immunological damage to the tissue.[2]The main targeted site of wound is skin, because skin act as barrio for protection of internal organ from external organ environment, skin contributed regulation of body temperature, protected from UV radiation and trauma. Skin serve as water repellent because skin contain oil that repel water and skin synthesize a number of useful component like Vitamin D.[3]Skin is the largest organ of the body and consist of two layers i.e. epidermis and dermis that are supported by number of underlying structure. This organ has multiple function. It is a barrier between the external and internal organ which are protected against environment, trauma, chemical, microorganism, mechanical stress and radiation.[4]Skin is the most visible organ in the body, injury refer to a damage to the skin tissue, which are occurs

due to trauma, U.V radiation and some microbial infection.[5]

Types of Wound Healing: [6]

Depending upon the injury and its causes the wound healing are classified into three main types

- a) Primary.
- b) Secondary.
- c) Delayed primary.

A. Primary Closure

It is also called as primary infection its describe when the injury happened then wound has been closure within hours which is possible due to little or less damage of tissue. In the primary wound when the injury occurs then this can be closer by using various techniques such as by using adhesive strips, sutures, stapes or clips and suture skin adhesives

B. Secondary Closure

It is also called as secondary intention, in this the wound should be left open to heal spontaneously due to the contraction of muscles. This type of injury are occurs due to the damaging and loss of the tissue cause due to internal damaging and loss of tissue cause due to the UV radiation

C. Delayed Primary Closure

They are also called tertiary wound closure when wound takes time near about 5-6 days for recovery then this type of wound is called delayed type of closure this may occurs due to vascularity, uncontrolled bleeding and sometime due to the microbial infection

II. OBJECTIVES

- 1) To formulate wound healing cream by using ingredients such as Neem and Tulsi.
- 2) Evaluation of herbal wound healing cream such as Appearance, consistency, spreadability, pH, skin irritation test and antimicrobial activity against gram positive, gram negative bacteria's and fungi

Sr. No	Common Name	Figure	Category
1	Neem		Antibacterial, Wound healing activity, skin ulcers, fever, cardiovascular diseases, liver problem.

2	Tulsi		Reduce gastrointestinal disorder, it relieve signs of asthma, antimicrobial, wound healing activity
3	Stearic Acid		Emulsifier, lubricant, Effective stabilizer, Helps to create cooling sensation.
4	Potassium Hydroxide		pH adjuster, buffers,
5	Cetosteryl alcohol		Moisturizer to treat or prevent dry, rough, scaly, minor skin irritation, emollient.
6	Liquid Paraffin		Emollient to treat itchy, dry, scaly skin condition.
7	Petroleum jelly		Heal minor skin scrapes and burn, moisturizer, Preserve perfume scent. Skin lubrication
8	Methyl Paraben		Antifungal, preservative,

9	Propyl parabem		Preservative, antioxidant and antimicrobial.
10	Lavender oil		Flavoring agent, Skin application, Used in massage Therapy.
11	Glycerin		Minimizing the water loss, keeping the skin hydrated.
12	Purified Water		Solvent, Conditioning agent, Cleansing agent.

Table 1: Drug & Excipient Profile

III. MATERIALS & METHODS

A. Preparation of Plant Extract: [7-10]

The extract was prepared by simple maceration. Firstly we were take 20 gm of each leaves of plants such as Neem and Tulsi, they were dried pulverized in air, and then they were soaked with 200ml of water for 48hr. After 24hr solvent was decanted and the residue again soaked with the same solvent for 24hr. The total extract was combined and filter then the evaporation of solvent was done on heating mental this was dried and stored in desiccator for further use.

B. Preparation of Cream: [11]

The wound healing cream were formulated by using fusion method. In that firstly we were prepared cream base by mixing oil phase and aqueous phase and then the herbal drug was mixed.

1) Preparation of Cream Base

For the preparation of cream base first weigh required quantity of stearic acid, cetostearyl alcohol, liquid paraffin and petroleum jelly in china dish they were melted on water bath at 750-780C. In another china dish take required quantity of remaining ingredient they were dissolve in water bath and melted at 760C. The aqueous solution then was added to the oily phase with constant stirring. Finally cream were filled in suitable plastic container.

2) Formulation of Cream:

The wound healing cream were formulated by mixing 1%, 2%, 3%, of the extract to the above prepared cream base with continuous stirring by mechanical stirrer, finally lavender oil was incorporated and filled cream was into collapsible tube.

a) Formula

Sr. No.	Ingredient	Quantity (%)
1	Neem	1
2	Tulsi	1
3	Stearic acid	3,2
4	Potassium Hydroxide	0.4
5	Cetosteryl Alcohol	1
6	Liquid paraffin	0.6
7	Petroleum jelly	0.6
8	Methyl paraben	0.02
9	Propyl paraben	0.02
10	Lavender oil	1
11	Glycerin	1.4
12	Purified water	Upto 20

Table 2: Ingredients of Herbal wound Healing Cream

IV. PHARMACEUTICAL EVALUATION OF CREAM: [12]

The formulation were evaluate for different pharmaceutical parameter

A. Physical Appearance

The formulated cream were observed for their visual appearance, transparency, color, consistency.

- Appearance: Semisolid in nature
- Color: Dark Brown
- Transparency: Non-Transparency
- Consistency: Smooth.



Fig. 1: Formulated Cream

B. pH – [13-14]

The pH of formulated cream were determined by using digital pH meter by dissolving 1gm cream in 100ml of water.



Fig. 2: pH Test

C. Consistency

The consistency of formulated cream were determined by hand. Take pinch of cream and rubbed it with finger.

D. Spreadability – [12]

The spreadability of the formulated cream were determined by 500mg of the cream was sandwiched between two slides. A weight of 100gm was placed on upper slide. The weight was removed and extra formulation was scrapped off. The lower slides was fixed on board of apparatus and upper slide was fixed with nonflexible string on which 20g load was applied. Time taken by slide to slip off was noted down.



Fig. 3: Spreadability

E. Antimicrobial Activity – [15]

When the wound has been occurred then there may be chances of bacterial or microbial infection from environment and Tulsi and Neem acts as antimicrobial and anti-inflammatory activity.

1) Procedure

In this method the agar is melted, cooled at 45°C, Inoculate with the test microorganism and then pour in the sterile petri plate. In this method when the agar plate has been solidified then holes about 9mm in diameter in the medium with sterile cork borer, Then the antimicrobial agent are placed in the hole and in another hole placed marketed formulation acts as standard, the diameter of zone of inhibition were measured after inoculation at 30-35°C for 2-3 days. The diameter of zone of inhibition gives an indication of the relative activity of different antimicrobial substance against tested microorganism.



Fig. 4: Pseudomonas



Fig. 5: Bacillus Cereus

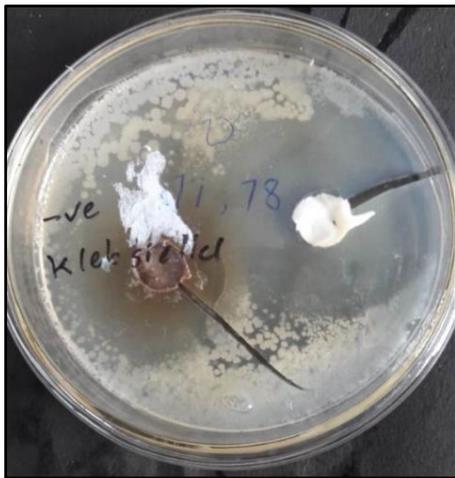


Fig. 6: Klebsiella Pneumoniae



Fig. 7: Streptococcus Aureus



Fig. 8: Fungi (Asparagus Niger)

F. Skin Irritation Study – [16]

In that we were take 0.5g of herbal cream and they are applied to the area pf approximately 6cm² of skin and then the skin were covered with a gauze patch for 1hr it should be in contact with skin, the patch was removed after completed time duration and observation has been recorded, control animal were prepared in the same manner and 0.5g of cream using all ingredient except the herbal extract was applied to the control animal and observation were made as same as that of test animal, The cream was applied to the skin once a day for 7 days and observed for any sensitivity and reaction.

G. Stability Studies - [17]

The stability of the formulation was tested by filling the cream in plastic container and placing it in humidity chamber at 45°C and 75% relative humidity. The stability of the formulation was inspected for 3 months at interval of One month each.

V. RESULT

- This cream could become a media to use these medicinal properties effectively and easily as simple dosage form.
- Natural Remedies are more acceptable as they are safer with fewer side effects than synthetic once, so a herbal wound healing formulation is nontoxic, safe, effective and improve patient compliance as it contain herbal ingredient. From the ancient time.
- These prepared herbal wound healing cream was evaluated for various parameters like appearance, determination of consistency, Spreadability, Skin irritation test and antimicrobial activity against Bacillus, Streptococcus, Klebsiella pneumoniae, pseudomonas and fungi (Asparagus niger).

Evaluation Parameter		Observation	
Appearance		Dark brownish colour, Lavender odour	
pH		6.57	
Consistency		Smooth	
Spreadability		Easily Spreadable	
Skin irritation test		No irritation	
Antimicrobial Activity			
Sr. No	Test Microorganism	Diameter of zone of inhibition	
		Standard	Test
1	Bacillus	18mm	16mm
2	Streptococcus	16mm	18mm
3	Klebsiella pneumonia	19mm	15mm
4	Pseudomonas	18mm	18mm
5	Fungi	17mm	18mm

Table 3: Evaluation of Herbal Wound Healing Cream

VI. CONCLUSION

- The main aim of formulated herbal wound healing cream was to cure or treat the wound and injury.
- It was concluded that the wound healing cream which are prepared from natural sources they shows fewer side effect as compared to cream which are prepared from synthetic compound
- The prepared wound healing cream was evaluated using various parameter and was found to be satisfied for the application to the skin where the injury has been occurs
- The prepared cream is planned to carry out with in vivo studied for its irritancy

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