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Efficacy Of Chuna And Turmeric In Promoting Wound Healing

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The efficacy of Chuna (lime powder) and turmeric in promoting wound healing has been a topic of interest in traditional medicine and modern scientific research. Chuna, a calcium-based substance, is believed to aid in the healing of wounds by providing essential minerals that enhance tissue regeneration and act as an antimicrobial agent. Turmeric, rich in curcumin, is known for its anti-inflammatory, antioxidant, and antimicrobial properties, which can significantly accelerate the wound healing process by reducing infection and promoting tissue repair. This review explores the mechanisms by which Chuna and turmeric contribute to wound healing, including their roles in collagen synthesis, anti-inflammatory responses, and infection control. Additionally, the potential synergistic effects of combining these substances are discussed, with a focus on their application in both traditional and contemporary therapeutic practices. Preliminary studies suggest that these substances, when applied topically or consumed, can enhance the healing process of minor wounds, cuts, and burns. However, further clinical trials and research are necessary to fully validate their efficacy and safety in wound care.

Keywords: Chuna, Wound Healing, Tissue Regeneration, Turmeric.

1. INTRODUCTION

1.1 Wound and Wound Healing Process

Wounds may be defined as a loss or breaking of cellular and anatomic or functional continuity of the deep skin tissue or the living tissues. Wounds may be produced by physical, chemical, thermal, viral, microbial, violence or the immunological trauma to the surface of the skin. Generally, wounds are termed as the physical injury that causes opening and the breaking of skin.

Where wound healing is a complex biological process that occur following through skin injury and sometimes trauma. It involves the several key stages, including the contraction and movement of cells as well as their re-adhesion. The healing process begins with aggregation of platelets and the formation of a blood clot, which is essential for stopping bleeding. This is followed by non-inflammatory response to the injury, which helps to clear out debris and prevent infection, additionally there are changes in the extracellular matrix, known as ground substances, and formation of new blood vessels, a process called angiogenesis. Finally, re-epithelization occurs, where new skin cells migrate to cover the wound. Wound healing can

have a serious clinical problem and are likely to increase when they are associated with disease such as diabetes, hypertension and obesity. The process of wound healing May be hampered by the presence of free radicals which will Damage the surrounding skin tissues. And the process of Wound healing is influenced by several factors such as Infections, nutrition, drugs and hormones, type and the sites of the wound and certain disease conditions. In India, since centuries people are using natural products Obtained from plant and animal for treatment wounds which was taught in a popular form of Indian medicine know As Ayurveda [1].

Wound healing on cutaneous and surface of skin is an essential physiological process consisting of the collaboration of many cell strains and their products. These are several efforts to heal the damage caused by local injury start soon after the inflammation begins, in the end in repair which consists of the substitution of structure by the deposition of collagen, and regeneration which corresponds to the process of cell proliferation and posterior differentiation through preexisting cells in the tissue and stem cell. These mechanisms do not simultaneously proceed after skin lesion in the same tissue, regeneration and repair can occur depending on the cell strains compromised by the injury [2].

Tissue regeneration and repair processes occur after the onset of the lesion. Be that due to the trauma or resulting from a specific pathological condition. One lesion is created by all of the stimuli that break the physical continuity of functional tissues. The stimuli that cause lesions can be external or internal, as well as physical, chemical, electric, or thermal. Moreover, the lesions can result in damage to specific organelles or to cells. Tissue repair is a simple linear process in which the growth factors cause cell proliferation, thus leading to an integration dynamic change that involve soluble mediators, blood cells, the production of the extracellular matrix, and proliferation of parenchymal cells. Where the skin healing process in which cell ad bio chemical events that occur in wound healing repair can be divided. Into the following stages such as – inflammatory reaction, cell proliferation, and synthesis of the elements which makeup the extracellular matrix and posterior period called remolding [2].

These processes of healing are known to be influenced by several factors such as infections, nutrition, drugs and hormones, type and sites of wound, and certain disease conditions, Agents with wound healing potential, which are obtained from natural and synthetic bioactive materials have the propensity for antioxidant, chelation and antimicrobial activities [3].

1.2 Chuna (quicklime)

Chuna is a therapeutic modality that addresses biomechanical function pathology diagnostics, to treatment in order to create a balance in orthopedic structure and function; Chuna states that both function and structure are systemically correlated.3 Chuna techniques include stimulation of the meridian system, correcting displacement of the osteoarticular structure, and prescribing exercises based on patient-reported symptoms and therapeutic result of a functional anatomical assessment. Representative techniques of Chuna are thrust, mobilization, distraction of the spine and joints, soft tissue release, visceral manipulation, craniosacral therapy, and the diaplasis technique [4]. The mechanism of action of calcium hydroxide on microorganisms can be explained by the influence of pH on growth, metabolism and bacterial cell division. The authors believe that the hydroxyl ions from calcium hydroxide develop their mechanism of action in the cytoplasmic membrane, because enzymatic sites are located in the cytoplasmic membrane. This membrane is responsible for essential functions such as metabolism, cellular division and growth and it takes part in the final stages of cellular wall formation, biosynthesis

of lipids, transport of electrons and oxidative phosphorylation. Extracellular enzymes act on nutrients, carbohydrates, proteins, and lipids that, through hydrolysis, favor digestion. Intracellular enzymes located in the cell favor respiratory activity of the cellular wall structure. The pH gradient of the cytoplasmic membrane is altered by the high concentration of hydroxyl ions of calcium hydroxide acting on the proteins of the membrane (protein denaturation). The effect of the high pH of calcium hydroxide alters the integrity of the cytoplasmic membrane by means of chemical injury to organic components and transport of nutrients, or by means of the destruction of phospholipids or unsaturated fatty acids of the cytoplasmic membrane, observed in the peroxidation process, which is a saponification reaction [5].

1.3 Turmeric

Turmeric (Curcuma longa L.), which is a member of the Zingiberaceae family, is a perennial herb that is widely Cultivated throughout tropical and subtropical regions of the world, such as India and China. Turmeric powder is a phenolic pigment, which is an antioxidant that can scavenge superoxide radicals, hydrogen peroxide and nitric oxide. In addition, Turmeric Powder has numerous health benefits, including antiprotozoal, anti-inflammatory, anti-venom activities and Anti-tumor activity, and is used widely in the cosmetics and pharmaceutical industry. Major bioactive components of turmeric are curcuminoids, such as curcumin (CUR), desmethoxycurcumin (DMC), and bisdemethoxycurcumin (BDMC). Curcuminoids are hydrophobic and readily soluble in organic solvents, such as methanol, ethanol, and acetone. Among organic solvents, ethanol was reported to have the highest extraction yield [6].
Turmeric has long been Used in both Ayurvedic and Chinese medicine as an anti-inflammatory, to treat digestive and Liver problems, skin diseases, and wounds. The curcumin in turmeric has been shown to Stimulate the production of bile by the gallbladder. Curcumin is also a powerful antioxidant; Antioxidants scavenge damaging particles in the body known as free radicals, which damage cell Membranes, tamper with DNA, and even cause cell death. Antioxidants can neutralize free Radicals and may reduce or even help prevent some of the damage they cause [7].

1.4 Herbal Cold Cream

More herbal ingredients are used to provide defined cosmetic benefits only, the shell is called “Herbal cosmetics” the demand for herbal medicines is increasing rapidly due to their lack of side effects. The herbal cosmetic is that it is purely made by herbs and shrubs. The herbs extracted from nature do not show adverse effects on human skin. Now a day’s cosmetics are used to improve their appearance. Cosmetics are preparing and using to improve their beauty. For various types of skin ailments formulations like skin protective, sunscreen, anti-acne, anti-wrinkle, either natural or synthetic. The development process for cosmetic formulation needs maintenance of quality standards. The herbs used in cosmetic preparations have varieties of properties like antioxidant, anti-inflammatory, antiseptic and anti-bacterial, etc. herbal products having no side effects compared with synthetic formulations. Cold cream is an emulsion which when applied on the skin, a cooling effect is produced due to slow evaporation of water present in emulsion. They are generally prepared by emulsification of oils and water. In older days cold cream was prepared from animal fats and vegetable oils [8].

Benefits of Herbal Cosmetics

- Being natural, least harmful effect on the skin or other body parts.
- Relatively safer.
- More placebo effect to the consumers due to its use in traditions and culture.
- Flexibility in formulation.
- Population proves effects from ancient time.
- Easy availability.
- Economical.
- It helps to cleans and beautify the body without side effects.
- It normalizes the body functions.
- It has extreme nutritional value with high content of vitamins and minerals.
- It enhances the energy level of body.

2. MATERIALS AND METHODS

2.1 Selection of Plant: Selection of a suitable medicinal plant based on its known therapeutic properties, traditional uses, and scientific literature. The plant should possess active constituents relevant to the intended application

2.2 Procurement of Plant Material and Some Important Ingredient
The curcuma longa herb was gathered from local Area of Chopda India. And got identified and Authenticated from Botanist. Then all foreign organic materials were completely removed from the gathered plant material. Then rhizome part of plant was separated, shade-dried, ground into a coarse powder, and then sieved. Also obtaining aloe vera same as from local area of Chopda, then obtaining chuna from local market of Chopda.

2.3 Authentication: The collected plant material will be authenticated by a qualified botanist or at a recognized institution such as a university department of botany. The collected Aloe vera sample will be authenticated at the Dadasaheb Dr. Suresh G. Patil College, Chopda, Department of Botany, by Prof. Dr. R. M. Bagul and a voucher specimen will be submitted.

2.4 Extraction: The authenticated plant material will be washed thoroughly, shade-dried, and ground into a fine powder using a mechanical grinder. The powdered material will be subjected to extraction using a suitable solvent.

a) **Extraction of Turmeric:** By using Soxhlet extraction 25 g of dried turmeric rhizomes powder is placed in a large beaker and 150ml of petroleum ether is added with a magnetic stirring rod. The suspension is stirred for 3 days. Then, the suspension is filtered and placed in a porous bag or "thimble" made of strong filter paper, which is placed in chamber of the Soxhlet apparatus. 300 mL ethanol in flask is heated, and its vapors are condensed in condenser. The condensed extractor drips into the thimble containing the turmeric rhizomes powder and extracts it by contact. When the level of liquid in chamber rises to the top of siphon tube, the liquid contents of chamber flood into flask. This process is continuous and is carried out until a drop of solvent from the siphon tube does not leave residue when evaporated. After 3 days, the solvent is evaporated by porcelain dish & heating mantle [9].

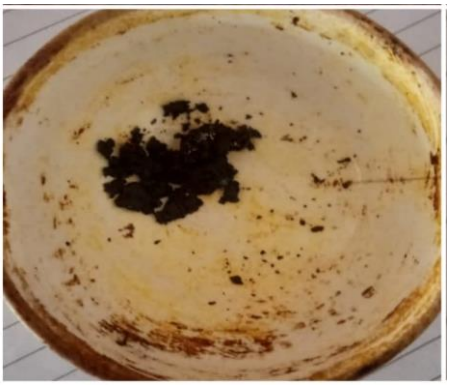

Fig. No. 1: Extract of Turmeric

b) Extraction of Aloe Vera

Harvesting Aloe Vera leaves: Select ripe, healthy leaves from the outer sections of the aloe vera plant while harvesting the leaves. Cut them near the plant's base using a sharp knife.

Cleaning the Leaves: To get rid of any dirt or debris, rinse the leaves under cold water.

Extracting the Gel: Use a spoon to scrape out the gel or a knife to scoop it out. Gather the gel into a sanitized container [10].

2.5 Formulation Ingredients

a) Beeswax

Scientific Name: Cera alba

Description: Beeswax is a natural wax produced by honeybees. It is a complex mixture of esters, hydrocarbons, and free fatty acids. Beeswax is a white to yellowish solid with a smooth, waxy texture

Category: Natural wax, Cosmetic ingredient, pharmaceutical excipients

Uses

- Cosmetics: Skin care products, lip balms, hair care products, and makeup.
- Pharmaceuticals: Tablet coatings, ointments, suppositories, and topical creams.
- Food industry: Food wrap, coatings, and polish for fruits and vegetables.
- Polishing: Furniture polish, shoe polish, surfboard wax, and musical instrument polish.
- Art and crafting: Encaustic painting, candle-making, and other craft projects.

b) Chuna (quicklime)

Scientific Name: The scientific name of Chuna is Lime (commonly referred to as "Chuna" in Hindi and other Indian languages), and the scientific name for lime, which is widely used in traditional medicine and other applications, is Citrus aurantiifolia

Description: Chuna is a small, green citrus fruit, known for its tangy, sour flavor. It's commonly found in tropical and subtropical climates. The fruit itself has a thin greenish skin and contains acidic juice. Category: Fruit, Citric acid plant

Uses: Lime is sometimes used in skincare for its brightening and astringent properties.

c) Turmeric

Scientific Name: Curcuma longa
Description: Turmeric extract is a concentrated form of curcuminoids, primarily curcumin, extracted from the rhizomes of the turmeric plant (Curcuma longa).
Category: Herbal extract (botanical category)
-Dietary supplement (nutritional category)
-Pharmaceutical ingredient (pharmaceutical category)
- Food ingredient (food category)
Uses: Anti-inflammatory, antioxidant, and anti-cancer properties - Skin care products for anti-aging, skin brightening, and acne treatment.

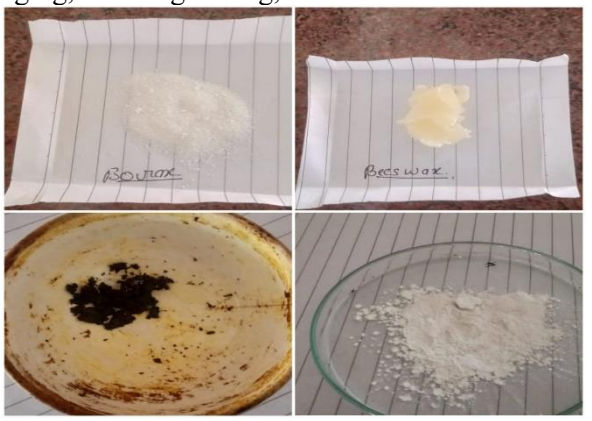

Fig. No. 2: Borax, Bees Wax, Turmeric Extract, Chuna

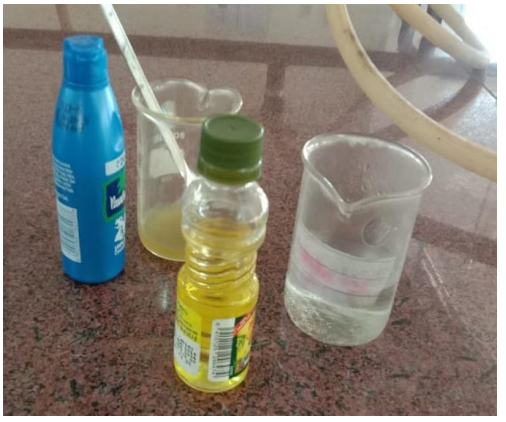

Fig. No. 3: Coconut Oil, Olive Oil, Aloe Vera Gel, Distilled Water

d) Aloe Vera

Scientific Name: Aloe barbadensis Miller (most commonly used species) Aloe vera (L.) Burm.f. (synonym)

Description: Aloe vera is a succulent plant that belongs to the Liliaceae family.

Category: Aloe vera is classified as: - Herb (botanical category), Succulent (plant category), Cosmetic ingredient (industrial category), Dietary supplement (nutritional category)

Uses: Skin care: Soothing skin irritations, burns, wounds, and eczema.

e) Borax

Scientific Name: Sodium Tetraborate

Description: Borax is a naturally occurring mineral compound composed of sodium, boron, oxygen, and water. - A white or colorless crystalline powder - Soluble in water and slightly alkaline

Category: Mineral (geological category) - Inorganic compound (chemical category) - Pesticide (pest control category) - Cleaning agent (household category

Uses: Skin care, hair care, and oral care - Antiseptic, antibacterial, and antifungal applications

f) Olive oil

Scientific Name: Olea europaea (botanical name of the olive tree)

Description: Olive oil is a liquid fat obtained from the fruit of the olive tree (Olea europaea). It is: - A complex mixture of triglycerides, mainly composed of oleic acid (C18:1)

Category: Olive oil is classified as: - Edible oil (food category) - Plant-based oil (botanical category) - Triglyceride oil (chemical category) - Functional food (nutritional category)

Uses: Moisturizing, protecting, and soothing skin irritations - Soaps, lotions, creams, and perfumes - Topical treatments for wounds, skin conditions, and pain relief.

3. FORMULATION OF CREAM FOR (50 gm)

Table No. 1: Composition of Ingredients

Sr. No.	Ingredients	Quantity
1	Chuna	2.30-2.50 gm
2	Turmeric extract	1gm
3	Aloe vera	5 gm
4	Beeswax	2.5 gm
5	Olive oil	10 ml
6	Coconut oil	7.5 ml
7	Borax	0.25 gm
8	Distilled water	1o ml

3.1 Preparation of Cold Cream

a) Preparation of Oil Phase for Formulation of W/O Cream

Firstly, prepared oil phase using adding sufficient quantity of ingredients in breaker such as adding olive oil, coconut oil and beeswax in glass beaker and heat using double boiler until beeswax are completely melted.

b) Preparation of Aqueous Phase

Simultaneously prepare aqueous phase by adding ingredients such as, add borax in distilled water heat them until borax are completely melted then add aloe Vera gel and stirred, adding turmeric extract and stirred well.

c) Addition of Aqueous Phase in Oil Phase

Slowly add aqueous phase into oil phase and continuously stirred until solidification of mixture occurs.

d) Addition of Chuna (quicklime)

in Mixture Add sufficient quantity of chuna in mixture and stirred continuously, stand for few minutes for cooling of solidified mixture then filled in sterile container and stored in room temperature [11].

4. EVALUATION PARAMETER

a) Organoleptic Properties: The wound healing cream has a smooth, consistent, and uniform texture, with a mild and pleasant odor. It is non-greasy, non-tacky, and leaves no residue on the skin. The cream appears to be physically stable and consistent in texture and appearance.

b) pH: A digital pH meter can be used to determine the pH level of the herbal cream. The cream is mixed with 100 mL of distilled water and allowed to stand for two hours. The pH is checked three times, and the average value is calculated [12].

c) Spread Ability: Spread ability may be expressed by the extent of the area to which the topical application spreads when applied to the affected parts on the skin. The therapeutic efficiency of the formulation also depends upon its spreading value. Sample (about 2gm) was applied in between two glass slides and they were pressed together to obtain a film of uniform thickness by placing 1000gm weight for 5 minutes. There after a weight 10gm was added to the pan and the top plate was subjected to pull with the help of string attached to the hook. The time in which the upper glass slide moves over the lower plate to cover a distance of 10cm is noted [12]. The spreadability (S) can be calculated using the formula

[S = m x L/T]

Where,

S – Spreadability

m- Weight tied to upper glass slide

l- Length moved on a glass slide

t- Time tacked

d) Wash Ability: The cream was applied on the hand and observed under the running [12].

e) Irritancy Test: An area of one square centimeter is outlined on the left dorsal side. The cream is applied to the marked area, and the starting time is noted. Any signs of irritation, redness, or swelling are monitored and documented at regular intervals over a 24-hour period [12]. The prepared formulation shows no irritancy.

f) Viscosity: Viscosity of the formulation was determined was Brookfield or Ostwald viscometer at 100 RPM, using spindle no. 7 at temp 25oC. The determinations were carried out in triplicate and the average of three reading was recorded [12].

g) Dilution Test: In this test type of emulsion is determined by diluting the emulsion either with water or oil. The emulsion is completely miscible with water if it is o/w type, as the dispersion medium is water and separates out if it is w/o type of emulsion. Similarly, w/o type of emulsion is miscible, if the emulsion is dissolved in oil but o/w type of emulsion is immiscible in oily liquid [13].

h) Homogeneity: The homogeneity was examined visually and tested [14].

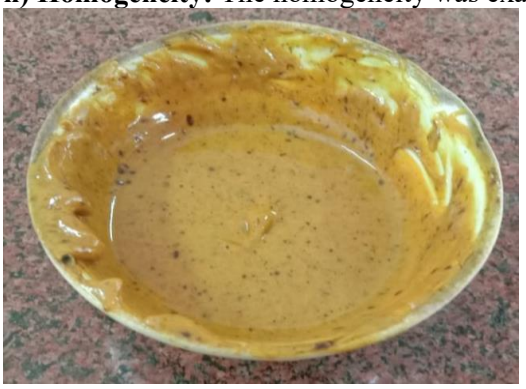

Fig. No. 4: Prepared Wound Healing cream

5. RESULT AND DISCUSSION

The developed wound healing cream formulation effectively delivered herbal actives to the skin, resulting in significant wound healing benefits. Wound Healing enhanced the bioavailability and efficacy of herbal extracts, leading to improved skin health and appearance. The project highlights the potential of cream as innovative formulations for herbal wound healing treatment, with implications for cosmetic and pharmaceutical industries.

Table No. 2: Evaluation Parameters

Sr. No.	Parameters	Result
1.	**Organoleptic Properties**	
2.	Color	Brown
	Odor	Characteristics Odor
	Consistency	Smooth Consistency
3.	**pH**	6.5
4.	**Spreadability**	Easily Spreadable
5.	**Wash Ability**	Some Greasiness Observe Because of More Amount of Oily Phase Present
6.	**Viscosity**	2150cps
7.	**Dilution**	Easily Soluble in Oily Medium Indicate W/O Cream

8.	**Homogeneity**	Good

6. CONCLUSION

In this study, the wound healing cream were prepared successfully for wound healing. Based on the current investigation, it can be said that the wound healing cream that was made to combat wound was a secure, practical, and effective way to distribute the herbal extracts. Thus, the intended wound healing characteristic was attained. As a result, the intended wound healing feature was acquired and is now present in skin care products. Excellent clarity, spread ability, wash ability, were displayed by the wound healing formulation. As a result, it will undoubtedly help with patience compliance and the skin wound healing issue. In conclusion, both chuna (calcium hydroxide) and turmeric have shown promising potential in promoting wound healing, though their mechanisms of action differ. Chuna is believed to aid in wound healing through its alkaline nature, which may help in neutralizing acids, and its potential antimicrobial properties, which can reduce infection risks. Turmeric, primarily due to its active compound curcumin, has demonstrated significant anti-inflammatory, antioxidant, and antimicrobial effects, which can support tissue repair, reduce inflammation, and prevent infection at the wound site. While both substances have traditional and scientific backing for their role in wound healing, more rigorous clinical studies are needed to fully understand their combined or individual efficacy and safety in wound care. Their use as adjuncts to conventional treatments may offer a natural, supportive approach, but they should not replace standard medical care, especially in severe or complex wounds.

7. ACKNOWLEDGEMENT

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8. CONFLICTS OF INTEREST

Authors have no conflicts of interest to declare.

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