AUCTORES
Globalize your Research

Biomedical Research and Clinical Reviews

Ravi Kumar Chittoria *

Open Access

Review Article

Aloe Vera a Promising Remedy for Scald Burns

Ravi Kumar Chittoria [1]*, Shanmuga Priya R[2]

[1]Department of Plastic Surgery & Telemedicine JIPMER Pondicherry

[2]Department of Plastic Surgery Jawaharlal Institute of Post graduate Medical Education and Research (JIPMER) Pondicherry.

***Corresponding Author:** Ravi Kumar Chittoria, Department of Plastic Surgery & Telemedicine JIPMER Pondicherry.

Received Date: February 11, 2025; **Accepted Date:** February 17, 2025; **Published Date:** February 22, 2025

Citation: Ravi K. Chittoria, Shanmuga R. Priya, (2025), Aloe Vera a Promising Remedy for Scald Burns, *J. Biomedical Research and Clinical Reviews*, 10(2); **DOI:10.31579/2690-4861/204**

Abstract

Aloe vera is widely recognized for its cost-effective benefits on the skin, with minimal associated risks. Its anti-inflammatory, wound-healing, and anti-aging properties have been extensively researched. Similar effects may also apply to burn injuries. In this study, we applied aloe vera gel to a patient with scald burns and monitored wound progression. As expected, the application of aloe vera gel significantly promoted wound healing.

Key words: aloe vera; burns; scald burns; treatment; wound recovery

Introduction

Scald injuries occur when living tissue is burned by hot liquids. Despite their common occurrence, a comprehensive approach to managing scald burns remains incomplete. Traditionally, treatment includes antibacterial or collagen-based dressings, along with antibiotics, fluids, and pain relief medications. Aloe vera has been used for wound healing for centuries. Its wide range of therapeutic effects is attributed to the approximately 75 bioactive compounds found in its gel, including enzymes, vitamins, minerals, and amino acids [1]. Additionally, it contains lignin, saponins, and salicylic acid.

The pain-relieving and anti-inflammatory properties of aloe vera are linked to the presence of prostaglandins and bradykinin-hydrolyzing enzymes, such as carboxypeptidase and bradykinase [2]. Furthermore, mannose-6-phosphate supports epithelialization, tissue organization, fibroblast proliferation, and collagen deposition, ultimately promoting faster wound healing. However, clinical evidence regarding its effectiveness remains limited. This case report aims to highlight the potential of aloe vera in enhancing scald burn recovery.

Materials and Methods

This study was conducted in the Department of Plastic Surgery at a tertiary care center in South India after obtaining approval from the departmental ethics committee. Written informed consent was obtained from the patient before participation.

A 42-year-old female patient with diabetes sustained a 5% scald burn injury involving the right anterior abdomen, right thigh, and left foot due to accidental exposure to hot liquid. She presented with severe pain and burn-related symptoms the following day. Upon admission, she was managed following the WHO burn care protocol. Hydro-jet-assisted debridement and regenerative therapies were performed to promote wound healing.

From the first day of treatment, aloe vera gel was applied to the burn wounds (figure 1) and reapplied during each dressing change. The gel is readily available in the Indian market in a gel-based formulation, costing approximately 100 Indian rupees per 100 grams.

Figure 1: Application of aloe vera

Results

The patient's burn wounds showed steady improvement each day, with no adverse reactions observed from the use of aloe vera. Healing progressed with minimal scarring, accompanied by a significant reduction in the BJWAT score. The patient was successfully discharged.

Discussion

Aloe vera has been extensively studied for its wound-healing properties and is known to accelerate tissue repair by suppressing thromboxane, a compound that inhibits wound healing [4]. Both in vitro and in vivo studies have demonstrated its effectiveness in reducing inflammation and promoting faster recovery. Magnesium lactate, a key component of aloe vera gel, plays a crucial role in preventing histamine production, thereby reducing skin irritation, itching, and discomfort [6]. Additionally, aloe vera enhances immune function by stimulating cytokine production while simultaneously regulating inflammatory responses. It achieves this by suppressing IL-6 and IL-8, reducing leukocyte adhesion, increasing IL-10 levels, and lowering TNF-alpha, all of which contribute to a significant reduction in inflammation [7].

Aloe vera contains glucomannan, a polysaccharide rich in mannose, which contributes to its regenerative properties. This compound enhances fibroblast growth factor receptor activation, leading to increased collagen synthesis, which is essential for tissue repair [3]. The topical application of aloe vera has been shown to prevent ulcer formation and promote the healing of various dermal injuries, including burns, frostbite, infections, surgical wounds, herpes ulcers, diabetic foot ulcers, and pressure sores. Among these conditions, burn wound healing has been the most widely studied [5].

Traditional burn treatments often include aloe vera due to its ability to accelerate recovery and minimize complications. Several clinical studies comparing its efficacy to conventional treatments, such as silver sulfadiazine 1% ointment, petroleum jelly gauze dressings, and framycetin cream, found that aloe vera was superior in promoting faster healing, preventing infections, and alleviating itching and redness.[1,2] Research suggests that first- and second-degree burns respond particularly well to aloe vera, with studies indicating that the healing process for these burns can be shortened by approximately nine days when aloe vera is applied.

Beyond burns, aloe vera has demonstrated effectiveness in treating post-operative wounds, including those from episiotomies, cesarean sections, skin biopsies, hemorrhoidectomies, gynecologic laparotomies, and skin grafts. In these cases, the use of aloe vera gel and cream significantly reduced pain and recovery time compared to standard medical treatments [3]. Additionally, aloe vera has been successfully used for the treatment of cracked nipples, leading to reduced pain and discharge.

Chronic wounds, such as pressure ulcers, diabetic ulcers, chronic anal fissures, traumatic wounds, psoriasis lesions, and genital herpes, have also shown improved healing outcomes with aloe vera treatment. Studies comparing aloe vera to saline gauze dressings, phenytoin, and other standard treatments found that aloe vera reduced pain, bleeding, and recovery time more effectively [5]. The gel's mucopolysaccharides, along with amino acids and zinc, contribute to enhanced skin integrity, improved moisture retention, reduced erythema, and ulcer prevention.

The anti-inflammatory, antibacterial, antiviral, and immune-boosting properties of aloe vera make it an excellent natural remedy for scald burn healing. By decreasing histamine activity and enhancing fibroblast migration, aloe vera provides an optimal wound environment that facilitates epithelialization and tissue regeneration. Most studies have primarily focused on first- and second-degree burns, with limited research on third-degree burns due to the full-thickness skin damage and higher risk of infection in these severe cases.

Aloe vera, available in both gel and cream forms, has also shown potential in the treatment of chronic wounds, including psoriasis lesions (applied twice daily for 4–8 weeks), pressure ulcers (1–3 months), venous and diabetic ulcers, herpes ulcers, and chronic anal fissures (2–3 weeks). By maintaining a moist wound environment, aloe vera optimizes fibroblast and epidermal cell migration, ultimately accelerating wound closure and recovery. Studies indicate that aloe vera, in doses ranging from 1 to 100 mg/kg, significantly enhances wound healing, further supporting its role as a valuable treatment option for scald burns and other injuries [2].

Conclusion

Aloe vera and its active compounds play a crucial role in maintaining skin hydration and integrity, making it a highly effective option for wound healing. It offers a more affordable and efficient alternative to conventional treatments by accelerating the healing process and improving wound recovery. Aloe vera is particularly beneficial in burn wound management due to its affordability, minimal side effects, widespread availability, and scientifically supported therapeutic properties. Since it is easily accessible in most Indian households and can be grown domestically, we strongly advocate for its use in treating scald burns. No adverse reactions were observed with its application.

References

1. Visuthikosol V, Chowchuen B, Sukwanarat Y, Sriurairatana S, Boonpucknavig V. (1995). Effect of aloe vera gel to healing of burn wound a clinical and histologic study. J Med Assoc Thai. 78(8):403-409.
2. N. Bunyapraphatsara, S. Jirakulchaiwong, S. Thirawarapan, J. (1996). Manonukul, The efficacy of Aloe vera cream in the treatment of first, second and third degree burns in mice, Phytomedicine, Volume 2, Issue 3Pages 247-251.
3. Sharma, Sonali BA; Alfonso, Allyson R. MD; Gordon, Alex J. BS; Kwong, Jennifer BA; Lin, Lawrence J. MD; Chiu, Ernest S. MD, FACS. (2022). Second-Degree Burns and Aloe Vera: A Meta-analysis and Systematic Review. Advances in Skin & Wound Care 35(11): 1-9
4. Maenthaisong R, Chaiyakunapruk N, Niruntraporn S, et al. (1995). The efficacy of aloe vera used for burn wound healing: a systematic review. 2007. In: Database of Abstracts of Reviews of Effects (DARE): Quality-assessed Reviews [Internet]. York (UK): Centre for Reviews and Dissemination (UK);
5. Levin N J, Erben Y, Li Y, et al. (2022). A Systematic Review and Meta-Analysis Comparing Burn Healing Outcomes Between Silver Sulfadiazine and Aloe vera. Cureus 14(10): e30815.
6. Moghbel, A., Ghalambor, A., Allipanah, S. (2007). Wound Healing and Toxicity Evaluation of Aloe vera Cream on Outpatients with Second Degree Burns. Iranian Journal of Pharmaceutical Sciences, 3(3): 157-160.
7. Duansak, D., Somboonwong, J., and Patumraj, S. (2003). 'Effects of Aloe Vera on Leukocyte Adhesion and TNF α and IL6 Levels in Burn Wounded Rats'. 1 Jan. 239-246.

DOI:10.31579/2692-9406/204