

## Role of Aloe-vera as a Regenerative Agent

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### Abstract

The perennial Liliaceae plant aloe vera has a number of medical applications. Skin can be healed by aloe vera. Aloe vera has anti-inflammatory, antiviral, antibacterial, antiseptic, and wound healing properties. Aloe vera shields skin and guards against ulcers. Studies on this subject are scarce. Aloe vera is recommended as either a primary or supplementary form of wound care. This narrative review looked at the healing and defense capabilities of aloe vera.

**Keywords:** Aloe-vera; Regenerative Agent; Wound Healing.

## INTRODUCTION

Aloe vera is a perennial herbaceous plant of the Liliaceae family that is utilised for a variety of medical conditions.<sup>1,2</sup> A medical plant called aloe vera has long been used to strengthen skin integrity. The anti-inflammatory, anti-bacterial, anti-viral, antiseptic, and wound healing effects of aloe vera are well documented.<sup>3,4</sup> Aloe vera can be used to

maintain the integrity and moisture of the skin as well as to stop ulcers. There isn't many research on this subject, though. Aloe vera is advised as the primary or supplementary treatment along with other techniques to promote wound healing.<sup>5</sup> The goal of the current study was to provide a narrative assessment of aloe vera's role in the treatment and prevention of skin wounds.

## MATERIALS AND METHODS

This study was conducted in the Department of Plastic Surgery in a tertiary care institute. Department scientific committee approval was obtained. It is a review article based on studies from the literatures available in Scopus, Cochrane and PubMed. It summarizes the usefulness of aloe-vera in the wound healing and as a regenerative agent.

## RESULTS

After analyzing the data from the article, aloe-

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vera will be discussed under following headings

1. History
2. Mechanism of action
3. Uses of Aloe-vera
4. Conclusion

## DISCUSSION

### *History*

The biological process of wound healing is intricate, and the primary goal of medicinal therapies is to promote tissue repair.<sup>6</sup> Burns, vascular disorders, surgery, and trauma are just a few of the factors that might result in skin lesions.<sup>7</sup> There are three stages to the dynamic process of wound healing. Inflammation, congestion, and leukocyte infiltration characterize the initial stage.

The second stage of proliferation entails the clearance of dead tissue, while the third stage of proliferation comprises the development of fibrous tissue and regenerating epithelium.

Aloe vera has been the subject of numerous research, all of which have demonstrated its efficiency in the treatment and healing of skin lesions. Since 1500 BC, various nations, including Greece, China, and Mexico, have employed aloe vera as a medicine.<sup>8</sup>

### *Mechanism of action*

Aloe vera has been proven to suppress thromboxane, an inhibitor of wound healing, enhance wound healing, and decrease inflammation in both in vitro and in vivo experiments. The gel's magnesium lactate can stop histamine from being produced, which stops skin irritation and itching.<sup>9</sup> Additionally, it improves the production of cytokines and the immune system. Through the suppression of IL-6 and IL-8, the reduction of leukocyte adhesion, the elevation of IL-10, and the lowering of TNF alpha, aloe vera effectively prevents inflammatory reactions. Due to the molecule glucomannan's abundance in polysaccharides like mannose, it has regenerating capabilities. Glucomannan boosts the activation and proliferation of fibroblast growth factor receptors, which in turn raises the production of collagen.

### *Uses of Aloe vera*

- Topical application of Aloe vera to prevent ulcers and enhance the healing process of dermal injuries (e.g., burns, frostbite, skin infections, surgical wounds, inflammation, herpes ulcers, diabetic foot ulcers, pressure sores, and chronic wounds) has been reported.

- Burn wounds were the subject of the majority of investigations. The traditional treatment for burns is aloe vera. Burn wound healing was examined in five studies. Aloe vera outperformed silver sulfadiazine 1% ointment, petroleum jelly gauze dressing, and framycetin cream in these studies. Additionally, it sped up healing, avoided wound infection, and stopped itching and redness. In these investigations, first and second degree burn wounds responded better to aloe vera treatment than burn lesions of other degrees. Aloe vera, it has been found, can speed up the recovery of first and second degree burns by 9 days.<sup>9</sup>
- Aloe vera was used on post-operative wounds such as episiotomy, cesarean section, skin biopsy, hemorrhoidectomy, gynecologic laparotomy surgery, and graft. In these studies, the use of Aloe vera gel and cream reduced the pain and recovery time compared to other conventional treatments.<sup>10,11</sup>
- Aloe vera was used for healing of cracked nipples in 2 studies and it reduced the pain and discharge in the area.
- Aloe vera has been effective in chronic wounds such as pressure ulcers, diabetic ulcers, chronic anal fissure wounds, chronic wounds caused by accidents, psoriasis, and genital herpes.
- Aloe vera was more effective compared to saline gauze dressing, phenytoin, and current treatments.
- Aloe vera reduced the pain, bleeding, and recovery time in chronic wounds. Aloe vera has also been effective in the prevention of ulcers. Mucopolysaccharides along with amino acids and zinc available in Aloe vera can lead to skin integrity, moisture retention, erythema reduction, and helps to prevent skin ulcers.
- Due to anti-inflammatory, increased immune activity, anti-bacterial and anti-viral effects, and decreased histamine activity properties of Aloe vera, it accelerates the healing process of burn wounds.
- The outcome of the present review study shows that Aloe vera is unanimously considered as the ideal dressing. Most studies have been performed on grade 1 and 2 ulcers and there are limited studies on grade 3 ulcers. The latter could be due to full thickness skin loss in grade 3 wounds and possible onset of wound infection.
- Aloe vera (as a gel or cream) can be effective to treat chronic wounds such as psoriasis lesions

(twice a day for 4-8 weeks), pressure ulcers (1-3 months), venous, diabetic, and herpes ulcers and chronic anal fissure (2-3 weeks).

- Aloe vera as a wound cover would keep the wound area moist and allows optimal migration of fibroblasts and epidermal. Aloe vera (1 to 100 mg/kg) can improve wound healing.

## CONCLUSION

Aloe vera and its constituents have qualities that make it possible to preserve the integrity and moisture of skin. Due to the presence of mucopolysaccharides, amino acids, zinc, and water, it also helps to prevent skin ulcers. Aloe vera is far more efficient and less expensive than the other treatments that are now accessible in terms of the quality and speed of wound healing. Aloe vera use for improving wound healing is advised as a complimentary treatment with other approaches due to its inclination to encourage traditional medicine. No negative effects noted with aloe-vera.

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