

## A Review on Wound Healing

Pandey A<sup>1\*</sup> and Mittal A<sup>2</sup>

<sup>1</sup>Department of Pharmaceutical Sciences & Technology, Birla Institute of Technology, Mesra, Ranchi, India

<sup>2</sup>Hindu College of Pharmacy, Sonipat, Haryana, India

\*Corresponding author: Anima Pandey, Department of Pharmaceutical Sciences & Technology, Birla Institute of Technology, Mesra, Ranchi, India, E-mail: animapandey11@gmail.com

### Mini Review

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### Abstract

In spite of the incredible progress in human medicine, infectious diseases caused by bacteria, fungi, viruses and other parasites are still a major risk to public health. Since ages, plants and herbs with wound healing, antioxidant and antimicrobial potentials are being used in India by traditional healers. Though the healing process occurs naturally, an infection, mostly from *S. aureus*, *E. coli*, *P. auregenosa* and *Bacillus spp.* can seriously delay it by prolonging the inflammatory phase and disrupting the normal clotting mechanism hence ultimately delaying angiogenesis. This delaying will also cause generation of reactive oxygen species. Over production of reactive oxygen species results in oxidative stress thereby causing cyto-toxicity and delaying wound healing. Hence estimation of both antioxidant and antimicrobial property of extract is relevant as these agents have synergetic effect on wound healing by destroying the free radicals and preventing the delaying of angiogenesis.

**Keywords:** Acute wound; Chronic Wound; Penetrating Trauma; Chemical injury; Thermal injury; Healing

### Introduction

Wound is an injury, especially one in which the skin or another external surface is torn, pierced, cut, or otherwise broken with disruption of normal continuity of structures and functions [1]. It may be produced by physical, chemical, thermal, microbial or immunological insult to the tissue. These result in the loss of continuity of epithelium with or without the loss of underlying connective tissue [2]. Wounds can be caused by any of the followings, Blunt or penetrating trauma, Surgery, Chemical injury, Thermal injury, Temperature extremes (e. g. Burns, frostbite), Radiation [3]. The signs and symptoms often accompany wounds are abnormal flushing of skin. Swelling as a result of the accumulation of the fluid in body tissues. Redness, throbbing pain and

tenderness in wound area is heated and possible fever with infection etc. Wounds are classified as open and closed wound based upon the underlying cause of wound creation and also as acute and chronic wounds on the basis of physiology of wound healing [4,5].

### Acute Wound

Acute wound is a tissue injury that normally progresses through an orderly and timely reparative process that results in sustained restoration of anatomic and functional integrity [6]. Acute wounds are usually caused by cuts or surgical incisions and complete the wound healing process within the expected time frame.

## Chronic Wound

Chronic wound is have failed to progress through the normal stages of healing and enter a state of pathologic inflammation are chronic wounds [7]. They either require a prolonged time to heal or reoccur frequently [8]. Local infection, hypoxia, trauma, foreign bodies and systemic problems such as diabetes mellitus, malnutrition, immunodeficiency or medications are the most frequent causes of chronic wounds [9,10]. The process of healing involves two distinct processes such as.

## Regeneration

When healing takes place by proliferation of parenchyma cells and usually results in complete restoration of the original tissue.

## Repair

When the healing takes place by proliferation of connective tissue elements resulting in fibrosis and scarring. Basic principle involved in wound healing is to minimize tissue damage and provide adequate tissue perfusion, oxygenation, proper nutrition and moist wound healing environment so as to restore the anatomical continuity and function of the affected part [11]. It involves continuous cell-cell and cell-matrix interaction, which allows the process to proceed [10]. The various phases of wound healing are Hemostasis phase, inflammatory phase, Proliferative phase and Remodelling phase. Whenever there is an injury, platelets release factors like macrophages and neutrophils. These are attracted towards wound and engulf the bacteria and produce other growth factors. These growth factors play role in remodelling of the scar by producing MMPs & TIMPs, ECM and new capillaries [12]. Ayurveda, the Indian traditional system of medicine, is based on the empirical knowledge of the observations and experience over millennium. It has been estimated that 70% of the wound healing Ayurvedic drugs are of plant origin, 20% of mineral origin and the remaining 10% consisting of animal products [13].

## Conclusion

The process of wound healing is promoted by several natural products as discussed above. These agents usually influence one or more phase of the healing process and are also involved in disinfection, debridement and providing a moist environment to encourage the establishment of a suitable environment for the natural healing process. Plants or chemical entities derived from plants need to be identified and formulated for treatment

and management of wounds. In this direction a number of herbal products are being investigated at present. Various herbal products have been used in management and treatment of wounds over the years. The plants have noteworthy antimicrobial and antioxidant action that could serve selective agents for infected wound.

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