Wound Healing Effect of Satureja Khuzistanica and Satureja Rechingeri Ethanolic Extracts in NMRI Adult Mice

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Abstract

Background: Scientists are trying to find ways for skin wound healing. The potential role of plants on wound healing is of interest and controversial.

Objectives: In this study, the effects of topical application of Satureja Khuzistanica and Satureja Rechingeri methanolic extract on skin wound healing in mice has been evaluated. Satureja Khuzistanica and satureja Rechingeri has anti-oxidant and anti-inflammatory properties and may enhance wound healing process.

Materials and Methods: For this experimental study, 48 healthy male mice were randomly designated to four groups of A, B, C and D which, respectively treated with, Satureja Khuzistanica extract, and satureja Rechingeri extract, methanol 98% for 22 days. Circular wounds were made in three layers of skin with 10mm diameter in all three layers (dermis, epidermis, and hypodermis). Specimens were taken at 3rd day, 7th day, 14th day and 22nd day for microscopic examinations.

Results: Compare H and E staining sections in the study groups showed that Satureja Rechingeri treated group has best effect on the wound healing in the comparison with placebo at 7th day, 14th day and don't ameliorate wound at 22nd day of treatment.

Conclusions: The results showed that Satureja Khuzistanica extract not suitable for wound healing. Satureja Rechingeri extract the fourteenth day is appropriate for healing and this plant has been limited period.

Keywords: Healing Process, Surgical Wound, Mice, Satureja Khuzistanica, Satureja Rechingeri

1. Background

The wound is gap or discontinuity in the epidermis or dermis that occurred following a traumatic or pathological changes in the skin or body [1]. Skin ulcers, caused by different reasons and divided into different types. Wound classification based on depth is divided into two types: The superficial and deep wound. Another classification is based on the length of wound that divided into two, acute and chronic wounds groups [2-5]. Wound healing is the most important biological processes, including repair and production of new tissue [6]. It’s activated a cellular response and contains a complex pathophysiological process including several cellular and biological sub processes, e.g. inflammation, angiogenesis, and collagen confession [7]. Angiogenesis is a landmark of wound healing that provides oxygen, nutrients, and blood-borne cells to the site of tissue injury. In inflammation phase, the vessels constrict and platelets activate the coagulation and fibrin following its creation. Macrophages are important cells in the inflammatory phase which stimulates wound healing. Inflammation phase started at the third day after injury and the maximum of damage observed at the third week. Collagen confession phase begins immediately and lasts for months. In this phase, collagen synthesis begins by fibroblasts and done stimulation of macrophages [8-12]. Inflammation maintenance and scarce vessel formation comprise the most noticeable causes of delayed wound healing [13]. On the other hand, wound fibrosis or anomalous increase of collagen in the wound that lead to an unpleasant scar [14]. Recent research has shown that several combinations are used for wound healing such as Acetic acid, Hydrogen peroxide [15]. Common plant extracts, e.g. Grape seed, Lemon, Rosemary, and Jojoba, have been employed for wound healing and longevity increase. All of these plants have a communal property, e.g. producing combinations with phenolic structure [16]. These phytochemicals ordinarily respond with some combinations such as oxygen free radicals and other macromolecules in order to neutralize free radicals and initiate biological special effects [16]. Medicinal plants have been used traditionally in the treatment of disease. Satureja Khuzistanica is established antioxidants that used in medicinal plants. Satureja khuzis-