

Role of Centella Extract in Donor Site Healing

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Abstract

Currently, several medicinal plants have been integrated into the health care system to aid in wound healing. Centella asiatica has been used in traditional medicine because of its ability to heal wounds and prevent scarring. This article is about the role of Centella asiatica in donor site healing.

Keywords: Centella asiatica, Donor site healing, Gene expressions, Scar, asiaticoside, madecassoside

INTRODUCTION

Wound healing process occurs with almost all medical treatments. Natural substances contained in herbs and plants have properties that assist in and enhance the wound healing process with its antioxidant, anti-inflammatory and antibacterial properties.^{1,2} The graft donor site is a superficial partial thickness wound in which there is loss of epidermis and part of the dermis.

Epithelialization is the natural act of healing dermal tissue resulting in minimal or no scarring.⁵ In most cases, scars occur if the depth reaches the dermis layer. When hypertrophic scar or keloid develops, it may induce itching, pain and even scar contracture.³ A lot of agents have been used to improve scars such as onion extract, resveratrol in grape's skin, curcumin and centella. The role of Centella asiatica in donor site healing is due to its anti oxidant and anti inflammatory and collagen remodelling property.⁶

PREPARATION

Centella asiatica, also commonly known as Gotu kola, is a small plant that belong to the family Apiaceae.⁴ The Centella asiatica is prepared by being extracted with 70% alcohol in cream preparation. It is formulated from 7% w/w Centella extract 100 gram, combined with Centella extract 7g., cetyl alcohol 15g., stearyl alcohol 12g., mineral oil 5g., cetomacrogol-1,000 3g., propylene glycol

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1g., paraben concentrate 1.5g, and water refill for total of 100g for the whole combination. The Centella extract comprised asiaticoside 5.12% and madecassoside 5.1% which has the wound healing property.

MECHANISM

The active compounds of *C. asiatica* responsible for donor site healing are pentacyclic triterpenes, including asiaticoside and madecassoside. In vitro studies demonstrated that asiaticoside decreases fibroblast proliferation in a dose-related manner and reduces the expression of both TGF- β I and TGF- β II at the transcriptional and translational level.¹⁰ Asiaticoside also slows down scar formation by increasing the activity process of SMAD 7 which is a negative regulator of TGF- β signalling.¹¹ The other active composition, madecassoside acts by inhibiting the migration of fibroblasts.¹² Both active chemical substances promote *C. asiatica* to induce fibroblast proliferation and collagen synthesis. It

involves the improvement of the tensile strength of newly formed skin and maturation of the scar by the production of type I collagen.⁷

APPLICATIONS

It is mostly often used for wound healing, treating mental fatigue, bronchitis, asthma, dysentery, kidney trouble, urethritis, antiallergic and anticancer purposes and even for blood pressure. It is rarely used for memory improvement with not much use. Use of Centellase for 4-8 weeks seems to improve blood circulation and reduce swelling in people with varicose veins.

ADVANTAGES

It has low adherence to the wound bed (Figure1). It doesn't have skin irritating potential and has no effects on serum biochemical profile when applied dermally. There is limited or no scar formation.^{8,9}



Fig. 1: Application of Centella asiatica on donor site

DISADVANTAGES

It can't be used in conditions like damage to skin caused by radiation therapy. It is safe when used for up to 10 weeks. It might cause itchiness and redness if used for longer period. Contact dermatitis^{13,14} can occur sometimes. It also might cause liver damage. Especially, people who already have a liver disease should avoid using centella asiatica since it might make liver problems worse.

CONCLUSION

The effect of Centella cream on scar development of the donor site of the split-thickness skin grafts may be attainable in terms of better pigmentation. By means of objective measurements and longer follow-up times, Centella cream may prove to be an alternative to prevent the formation of hypertrophic scar.

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