



Case Report

Wound care used topical ointment made from a combination of cherry leaf extract (*Muntingia calabura* L) and manuka honey on the healing process of superficial second-degree burns: a case report

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ABSTRACT

Background: Burns are one of the most common accidental injuries in the community. Improper treatment of burns can lead to disability and even death. Applying topical therapy aims to reduce excessive collagen repositioning and accelerate healing. We tried treating burn wounds with an ointment that uses a combination of cherry leaf extract and manuka honey to test the effectiveness of wound healing.

Case presentation: We report two cases of superficial burns that underwent wound treatment using an ointment containing cherry leaf extract and manuka honey.

Conclusion: Wound treatment with an ointment containing cherry leaf extract and manuka honey can speed up the healing process in patients with superficial second-degree burns.

INTRODUCTION

A burn is tissue damage or loss that occurs when tissue is exposed to a heat source.¹ The prevalence of burns remains high worldwide, as evidenced by the 180,000 deaths per year. According to the Ministry of Health's 2018 Basic Health Survey, the incidence of burns in Indonesia increased by 35%. Females had a prevalence of 0.8%, while the prevalence in males was 0.6%.²

Untreated burns can affect the body's metabolic system and cell function, affecting the patient's recovery and can even lead to death. Topical therapy aims to reduce excessive collagen repositioning in scar tissue and accelerate healing. The composition and prominence of ingredients in topical therapy for burns should be considered to minimize germ growth, eliminate tissue damage, and accelerate the healing process.³

Kersen (*Muntingia calabura* L.), commonly found in tropical regions like Indonesia, is known for its conventional use in treating skin conditions. The plant contains flavonoids, saponins, and tannins, which help reduce inflammation, dilate blood vessels, and reduce edema. Tannins regulate VEGF, epithelialization, and anti-inflammatory properties, while saponins promote angiogenesis, VEGF synthesis, and skin healing.^{4,5}

Manuka honey contains the antibacterial ingredient methylglyoxal, this type of honey is often used to heal wounds.⁶ Manuka honey also contains more stable hydrogen peroxide, which has antimicrobial qualities. The antibacterial and anti-inflammatory properties of manuka honey can speed up burn recovery. Amino acids, carbohydrates, proteins, and various minerals and vitamins found in manuka honey support the body's natural healing process.⁷

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A combination of ointment of Kersen leaf extract and manuka honey has been studied before. The composition consists of 5% Kersen leaf extract and 30% manuka honey. The results of the previous study showed promising results against burns. The main composition of Kersen leaf extract, which is useful as an antibacterial and anti-inflammatory, and manuka honey contains methylglyoxal, which accelerates the epithelialization of burn wounds due to its antimicrobial efficiency and cell proliferation effect; the only drawback was that there was no comparison during the study.⁸⁻¹⁰ In this study, we will report the effectiveness of topical ointment made from a combination of cherry leaf extract and manuka honey for superficial second-degree burns in two cases in a clinical setting.

CASE PRESENTATION

Case 1

Mr K, 42 years old, self-employed, living in Tegalrejo, Magelang. Assessment on December 21, 2023, obtained the patient said he was burned about ten days ago, and the wound was sore and took a long time to dry. Wound care is carried out independently, cleaned with NaCl and then smeared with standard ointment. Objective data showed that the wound was in the facial area, total body surface area (TBSA) of 3.5%, the wound area is about 10 cm x 13 cm (Figure 1A), minor degree II, the edges look fused with the wound base, the color of the wound base is reddish, the color of the skin around the wound is pink, there is no tissue necrosis, no odor. Wound care was performed by cleaning the wound using 0.9% NaCl, drying the

wound with sterile gauze, and applying topical ointment made from a combination of cherry leaf extract and manuka honey to the wound thinly and evenly; the patient was advised to apply ointment 2 times a day. After 10th days, the wound was healed, as indicated by the condition of the wound; the skin color around the wound was pink (Figure 1E).

Case 2

Mr A, a farmer, is 79 years old and lives in Dukun, Magelang. Assessment on December 22, 2023, obtained the patient said he got burns about 14 days ago, pain in the wound, and the wound wet. Previous wound treatment was carried out by the Health Center, cleaned with NaCl and then smeared with standard ointment. Objective data showed that the wound was located on the chest area and left hand, with a TBSA of 8%. The wound area was about 16 cm x 15 cm (Figure 2A), grade II major; the edges were seen to merge with the wound base, the color of the wound base was reddish, the skin color around the wound was pink, there was sticky necrosis tissue, soft, there was black false scar tissue, the wound smelled, purulent exudate, the amount of exudate was moist. Wound care was performed by cleaning the wound using 0.9% NaCl, performing debridement, drying the wound with sterile gauze, applying topical ointment made from a combination of cherry leaf extract and manuka honey thinly and evenly on the wound, and closing it using gauze and wrapping with a verbal (left-hand part). The patient was advised to apply ointment twice a day. After 10 days, the wound was healed, and TBSA decreased become 3.5%. The wound area was approximately 6 cm x 9 cm (Figure 2E).



Figure 1. Wound Documentation of Mr K. A: Treatment on the second visit (the wound looked dry, the wound area was about 10 cmx13 cm, reddish color of the wound bed, and 3.5% burn percentage); B Treatment on the third visit (the wound looked dry, the wound area was about 7 cmx10 cm, the base color of the wound was reddish, and 3% burn percentage); C Treatment on the fourth visit (the wound looked dry, the wound area was about 6 cmx9 cm, the base color of the wound was reddish, and 2% burn percentage); D Treatment on the fifth visit (the wound looked dry, the wound area was about 2 cmx4 cm, the base color of the wound was reddish, and 1% burn percentage); E Treatment on the sixth visit (the wound has healed, the skin color around the wound is pink/normal).



Figure 2. Wound Documentation of Mr A. A: Treatment on 2nd visit (the wound appeared wet, the wound area was about 16 cm × 15 cm, there was necrotizing tissue that was sticky, black false scar tissue, odorous wound, purulent exudate, and 8% burn percentage); B Treatment on 3th visit (the wound appeared wet, the wound area was about 14 cm × 13 cm, there was necrotizing tissue that was sticky, black false scar tissue, odorous wound, purulent exudate, and 7% burn percentage); C Treatment on 4th visit (the wound appeared wet, the wound area was about 12 cm × 11 cm, there was necrotizing tissue that was sticky, black false scar tissue, odorous wound, purulent exudate, and 6% burn percentage); D Treatment on 5th visit (the wound looks moist, the wound area is about 9 cm×10 cm, the color of wound bed is reddish, there is no necrosis, odorous wound, no exudate, and 5% burn percentage); E Treatment on 6th visit (the wound looks moist, the wound area is about 6 cm×9 cm, the color of wound bed is reddish, there is no necrosis, odorous wound, no exudate, and 3,5% burn percentage).

DISCUSSION

A topical ointment made from a combination of cherry leaf extract and manuka honey was effective in accelerating the burn wound healing process. This was shown by a decrease in the percentage graph of burn area after 10 days of treatment. The use of ointment as a topical therapy with the main composition of Kersen leaf extract and manuka honey is able to inhibit bacterial growth, reduce swelling and redness around the wound, as an antioxidant, maintain wound moisture so that it can help accelerate wound healing and can stimulate the process of removing necrotic tissue.^{11,12}

Kersen leaves are scientifically proven to have several pharmacological properties, including being anti-inflammatory, anti-hyperlipidemia, antibacterial, antioxidant, and anthelmintic.¹³ Some research results show that the pharmacological effects of Kersen leaves are due to the synergistic action of several concentrations of secondary metabolites. Flavonoids are the main component of compounds in Kersen leaves, but these leaves also contain alkaloids, tannins, saponins, and terpenoids.¹⁴ Manuka honey contains methylglyoxal (MGO), which has antibacterial qualities besides producing hydrogen peroxide and has antimicrobial qualities. MGO has antioxidant compounds, such as flavonoids, which can fight free radicals and support cell health.¹⁵ Manuka honey has many biological properties, such as antibacterial, anti-inflammatory, antidiabetic, wound healing, anti-cancer, and immunomodulatory.¹⁶

The use of ointment in wound care begins with monitoring wound characteristics, washing the wound with 0.9% NaCl, and debridement of necrotizing tissue to clean the

wound and accelerate the healing process. After debridement, rewash the wound with 0.9% NaCl and dry it with sterile gauze. Then, apply ointment to the burn area thinly and evenly, cover it with sterile gauze, roll up the gauze, and secure it with a plaster.¹⁷

Figures 1 and 2 are the results of wound documentation in both patients. In Figure 2A, wound documentation of Mr K, there is a burn on the face area with a percentage of 3.5%; after taking nursing actions using ointment until the tenth day, in Figure 2E, there was a change in the percentage of burns to healed wounds. In Figure 3A wound documentation of Mr A, there is a burn on the chest area and left hand with a percentage of 8%; after taking nursing measures using ointment until the tenth day, in Figure 2E, there was a change in the percentage of burns to 3,5%, necrosis tissue is absent, and granulation tissue is expanding.

The administration of ointment can accelerate the wound healing process because of the content in Kersen leaf extract and manuka honey, which has a mechanism of action on living tissue. Flavonoids function by damaging the permeability of bacterial cell walls.^{18,19} Tannin chemicals have an astringent effect and can cause the skin to close.²⁰ Saponin compounds act as antiseptics and stimulate the formation of new cells.²¹ Manuka honey accelerates processes, including clotting, inflammation, cell proliferation, and tissue remodelling, that usually accompany natural wound healing.²² In addition, the antioxidant content in honey helps protect against the entry of free radicals in the body.²³ Based on the respondent's responses, ointment provides a cooling sensation that makes patients comfortable because the resulting cooling sensation can reduce itching and burn in the burn area.

CONCLUSIONS AND RECOMMENDATION

In this study, the wound areas healed well. The wound experienced a decrease in the percentage of the wound area, necrosis tissue, and granulation tissue increased. Applying and treating burn wounds using topical ointment made from a combination of cherry leaf extract and manuka honey can be an alternative to optimize wound healing and provide comprehensive nursing care for burn patients. Next, studies need to involve larger samples and a more extended period to ensure the effectiveness of this ointment.

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