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Original Article

The Effectiveness of KaTriNa Ointment as Topical Therapy on the Healing Process of Superficial Second-Degree Burns: Case Report

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A B S T R A C T

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. One of the topical therapies is using KaTriNa Ointment with 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.

Purpose : To prove the effectiveness of KaTriNa ointment in accelerating superficial second-degree burn wound healing.

Methods : This case study focuses on skin integrity disorders and nursing care in a patient with superficial second-degree burns using KaTriNa ointment. This case study was conducted for 10 days by applying the ointment twice a day. This case study covers all phases of the nursing process, including assessment, diagnosis, intervention, implementation, and evaluation.

Result : The use of KaTriNa ointment in wound care showed changes to the burn wound. The wound underwent changes in the reduction of the percentage of wound area, necrosis tissue, and granulation tissue increased in area.

Conclusion : The ingredients contained in KaTriNa ointment can accelerate the wound healing process in both patients with superficial second degree burns.

INTRODUCTION

Burns are damage that occurs when the skin and/or tissues are exposed to a heat source[1]. The prevalence of burns remains high worldwide, as evidenced by the 180,000 deaths per year[2]. Most cases of burns worldwide occur in low- and middle-income countries. According to the Ministry of Health's 2018 Basic Health Survey, burns increased by 35%, and 80% of burns occur at home when cooking, heating, or using electrical appliances[3].

To prevent burns, it is very important to follow proper precautions. Proper care during a burn can help prevent complications[4]. Cooling the wound with running water, covering the wound to prevent infection, and providing proper first aid can significantly impact the outcome of treatment. This becomes an emergency treatment at home and in the community at the pre-hospital stage[5]. Assessment of the burn pathway and location is the first step in the evaluation process[6]. This involves stability assessment, dose adjustment, and evaluation of physical properties[7]. An effective topical antibiotic should have good penetration, low systemic activity, and not cause necrosis[8].

Topical therapy aims to reduce excessive collagen repositioning in scar tissue and accelerate healing{Citation}. 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[8].

Kersen (*Muntingia calabura L.*), commonly found in tropical regions like Indonesia, is known for its conventional use in treating skin conditions[9]. 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[10].

Manuka honey contains the antibacterial ingredient methylglyoxal, this type of honey is often used to heal wounds. 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[11].

KaTriNa Ointment with 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[12].

There has been no research on the effect of KaTriNa ointment on burn wound healing. This study proves the effectiveness of KaTriNa ointment in wound healing in patients with superficial second-degree burns.

METHOD

Study Design

This research uses a descriptive case study to describe nursing care about the use of KaTriNa ointment as a topical therapy for the healing process of superficial second-degree burns.

Setting and Respondent

This research was conducted in Magelang district in December 2023. The case study subjects for nursing care were two patients with burns that caused damage to the skin and tissue integrity[13]. This case study involved patients with superficial second-degree burns who were willing to participate in wound care.

Making KaTriNa Ointment

KaTriNa ointment is a Vocational Matching Fund grant product produced by PT Capung Indah Abadi. This ointment has a main composition of kersen leaf extract formulation and manuka honey. Every 1 gram of KaTriNa ointment contains 2.5% kersen leaf extract, 2% manuka honey. After the ethanol extract of kersen leaves was subjected to phytochemical screening, flavonoids, tannins, and saponins were found in the extract[14]. Germs that infect wounds can be inhibited or even killed by the tannin and flavonoid content of kersen leaves[15]. Manuka honey affects immunological activity, the body's defense mechanism, which is associated with wound healing. A series of processes including clotting, inflammation, cell proliferation, and tissue remodeling usually accompany natural wound healing[16].

KaTriNa ointment has been certified free of chloramphenicol and residual hexane solvents number because these two compounds are solvents that are toxic if used for a broad spectrum[14]. In addition to being free of chloramphenicol tested (certified no: SIG.LHP.XI.2023.301653591-3) and free of residual hexane solvents (certified no: 02119B.01/X1/UN1/LPPT/2023), KaTriNa ointment has been laboratory tested free of ethanol, to ensure that ethanol is no longer contained in the extract, and because ethanol is antibacterial, it does not cause false positives in sample treatment[17].

Experiment Procedure

The intervention in this study was nursing care, with the aim that after nursing care for 10 days, it is hoped that the nursing problems that arise can be resolved. The nursing plan that can be carried out includes monitoring wound characteristics (wound percentage, wound size, wound degree, skin color around the wound, wound base color, exudate, wound odor, and wound edge conditions), performing wound care with KaTriNa ointment, scheduling the frequency of wound care with KaTriNa ointment thinly and evenly 2 times a day, explaining the signs and symptoms of infection[18,19].

Variable, Instrument, and Measurement

The variable in this study was the percentage of burn area assessed using the rule of nine[20]. Performed on the second day until the tenth day.

Data Analysis

The data in this study were analyzed using the rule of nine assessment and changes in burn characteristics[20].

Ethical Consideration

This research has passed the ethical test conducted by Health Research Ethics Commission, Faculty of Health Sciences, University of Muhammadiyah Magelang, with registration number 0138/KEPK-FIKES/II.3.AU/F/2024.

RESULT

Figure 1 is a product image of KaTriNa ointment. This product has a composition of 2.5% kersen leaf extract

and 2% manuka honey in every 1 gram. Figure 2 is a graph of the percentage change in burn area after treatment using KaTriNa ointment.

Figure 1. The Topical Ointment Formulation of *Muntingia calabura L.* and Manuka Honey (KaTriNa Ointment)

Figures 3 and 4 are the results of wound documentation in both patients. In Figure 3A, there is a burn on the face area with a percentage of 3.5%, after taking nursing actions using KaTriNa ointment until the tenth day, in figure 3E there was a change in the percentage of burns to healed wounds.

In Figure 4 is the result of documentation of second patient. In figure 4A there is a burn on the chest area and left hand with a percentage of 8%, after taking nursing measures using KaTriNa ointment until the tenth day, in figure 4E there was a change in the percentage of burns to 4%, necrosis tissue is absent, and granulation tissue is expanding.

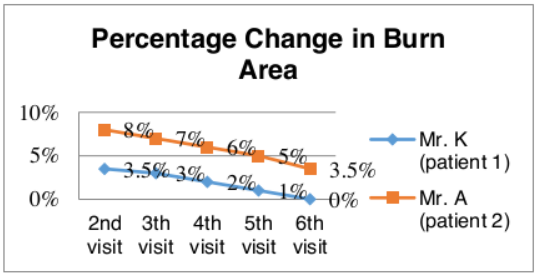

Figure 2. Graph of the Percentage Change in Burn Area

Figure 3. The Result Of Documentation First Patient. 3A : Treatment on 2nd day; 3B Treatment on 3th day; 3C Treatment on 4th day; 3D Treatment on 5th day; 3E Treatment on 6th day

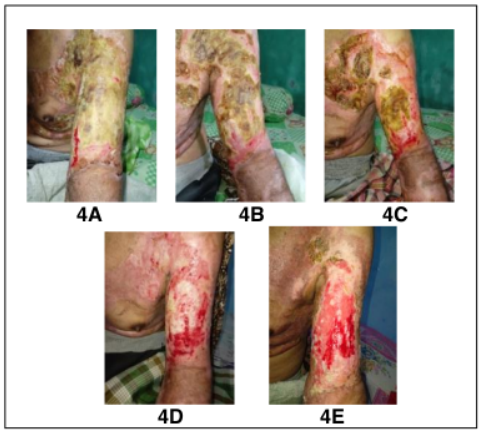

Figure 4. The Result Of Documentation Second Patient. 4A : Treatment on 2nd day; 4B Treatment on 3th day; 4C Treatment on 4th day; 4D Treatment on 5th day; 4E Treatment on 6th day

DISCUSSION

The results showed that the use of KaTriNa ointment 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 KaTriNa 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 dead / necrotic tissue[15,11].

Kersen leaves (*Muntingia calabura L.*) are scientifically proven to have several pharmacological activities including anti-inflammatory, anti-hyperlipidemia, antibacterial, antioxidant, and anthelmintic[9]. 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[21].

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. Manuka honey has many biological properties, such as antibacterial, anti-inflammatory, antidiabetic, wound healing, anticancer, and immunomodulatory[11].

The use of KaTriNa 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, wash the wound again with 0.9% NaCl and dry it with sterile gauze. Then, apply KaTriNa ointment to the burn area thinly and evenly, cover with sterile gauze, roll up the gauze, and secure with a plaster.

The administration of KaTriNa ointment can accelerate the wound healing process because of the content in kersen leaf extract and manuka honey with the mechanism of action on living tissue, flavonoids function by damaging the permeability of bacterial cell walls. Tannin chemicals have an astringent effect and can cause the skin to close. Saponin compounds act as antiseptics and stimulate the formation of new cells[9]. Manuka honey accelerates processes including clotting, inflammation, cell proliferation, and tissue remodeling that usually accompany natural wound healing. In addition, the antioxidant content in honey helps protect against the entry of free radicals in the body[16].

Based on the respondents responses, KaTriNa ointment provides a cooling sensation that makes patients comfortable because the resulting cooling sensation can reduce itching and burning in the burn area.

CONCLUSIONS AND RECOMMENDATION

The results of this case study, the use of KaTriNa ointment in wound care showed changes in the burn wound. The wound experienced a decrease in the percentage of wound area, necrosis tissue, and granulation tissue increased in area. So it can be concluded that the ingredients contained in KaTriNa ointment can accelerate the wound healing process in both burn patients. The application and treatment of burn wounds using KaTriNa ointment as a topical therapy in the healing process of superficial second-degree burns can be an alternative to optimize wound healing and provide comprehensive nursing care for burn patients.

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