Jurnal Saintika Medika
Jurnal Ilmu Kesehatan dan Kedokteran Keluarga
Faculty of Medicine UMM

Vol. 15 No. 2 December 2019
p-ISSN : 0216-759X e-ISSN : 2614-X476X
http://ejournal.umm.ac.id/index.php/sainmed

Case Report

Case Study: The Use of Metcovazin® in Curing Burns

Irnawati

STIKES Muhammadiyah Pekajangan Pekalongan

Email : irnawatiiirna@gmail.com

Received : Oct 3th2019. Revised : Nov 15th2019. Published: Dec 25th2019.

DOI : https://doi.org/10.22219/sm.Vol15.SMUMM2.9962

ABSTRACT

Burn is the most common trauma for kids happens due to contact with fire, hot objects, electricity and chemicals. The size, location and depth of burn become the main factor that affect the curing treatment. Complication, such as; infection, toxic shock syndrome, scar and psychological symptoms, can be occurred if the wound did not treated in a good and proper way. This study aimed to describe about the use of metcovazin® and management treatment on two cases of second degree burns. The principle of TIME (Tissue management, Inflammation & Infection control, Moisture balance, Edge) as the modern dressing used for wound's management treatment. The result showed that using TIME management treatment could quicken the healing process of the wound. It was able to increase basic defense of a healthy wound. The combination of metcovazin® and modern dressing were effective in curing the second-degree burns.

Keywords : metcovazin®, burns, TIME, modern dressing.

INTRODUCTION

Burns injury is a skin damage which not only caused by hot objects but also by cold objects, chemicals and electricity. Skin is a complex organ with various function, such as sun barrier and protection, immunity, vitamin D synthetic, degree control, sensation, flexibility and cosmesis. Losing small part of the skin could lead the allocation response which increase the burns area. Hence the response becomes general with significant effect to whole body systems (Purdue, Arnoldo, & Hunt, 2011). World Health Organization reported 180.000 death of people every year caused by burns injuries. In 2004, almost 11 million people worldwide had severe burns injuries and needed medical treatment (Pereira, Barrias, Granja, & Bartolo, 2013).

The depth of burns is clarified based on the damage level of epidermis and dermis. Superficial burns only affects the dermis (first degree burns: epidermis) or epidermis and the upper part of dermis (second degree burns: dermal superficial). While depth burns involves more than a

half dermis (third degree burns: deep dermal) or the whole dermis (forth degree burns: full thickness) (Kowalske, 2011).

Wound dressing is developed to help the re-epilation, to prevent skin infection, dry skin and further skin damage (Wang et al., 2018). It also a medium to protect the injury, prepare the condition for curing the wound and take care patients' comfort. However, the selection of wound dressing is adjusted based on the burns degree (Gill & Falder, 2017).

The first degree burns or superficial epidermal has characteristic of pink color, blister, sore and capillary refill. The treatment of first degree burns has purpose to prevent infection, control exudate, push epilation and function. Wound dressing that could absorb the exudate (aquacel®) and non-adherent (Urgotul®) could be the option for curing first degree burns by covering the wound with cotton (Horst, Chouhan, Moiemen, & Grover, 2017).

The second degree burns or superficial dermal has pale pink color with capillary refill. The wound is blister, sore and wet. The treatment is aimed to prevent the infection, to control the exudate, to push the healing and prevent the depth extension of the wound. According to Vigani & Culler (2017) the wound healing process for second degree burns could pushed with antibacterial wound dressing (silver dressing), exudate wound dressing and metcovazin®.

Meanwhile, the treatment for third degree burns or deep dermal has aim to prevent the infection, to control exudate, to prepare base wound for excision and skin graft. The third degree burns has characteristic of white spotted and red dotted color wound, no capillary filler, dried, and low pain wound. Antibacterial wound dressing, such as silver sulphadiazine (flamazine®) or nanocrystalline silver (acticoat®) could be an option for third degree burns healing treatment.

The fourth degree burns or deep dermal has characteristic of white color, no capillary filler, and burned, inflexible, dry and low pain. The fourth degree burns treatment has purpose to prevent infection and to prepare the wound for excision and skin graft. Wound dressing with silver sulphadiazine could stand for 24 hours until the swelling reduced (Ahuja et al., 2016). Therefore, this case study described about the incidence of second degree burns and its management. The case study can be seen below:

CASE 1 :

A two years old child named D had second degree burns with wound on the Right ulnar region. This wound occurred when D's mother was ironing clothes and D, accidentally, touched the hot steam iron. D was brought to *Irna Wound Care*, a private praxis, to get her first aid. D's general condition was compos mentis, D looked crying because of the wound. The wound checkup showed that D had burns area for ½% with second degree burns. There was a bullosa covering 100% wound and filled with serous fluid. The wound base color was 100% red with size of 3.5 x 1.5 cm, capillary refill less than 3 seconds (< 3), and had no sign of infection. The wound treatment management was using TIME principle, consisted of; T: autolytic debridement, I: wound washing

with NaC1, M: cover the wound with topical therapy – (Metcovazin®), hydrophilic cotton (Bunda®), and non-sterile elastic gauze bandage (Elastomull®) as fixation, E: Education for mothers on nutrition to increase body immune. Also, information that the wound bandage should not exposed to water during the treatment.

Figure 1. Burns on D's hand caused by hot steam iron

CASE 2 :

A twenty seven months child named L had second degree burns caused by cigarette on fibula sinistra area. L accidentally touched the cigarette of his father, while his father is smoking. L was brought *to Irna Wound Care* for getting his first aid. L's general condition was compos mentis, L seemed crying cause of pain he had. The wound checkup showed the burns area was ¼% with second degree burns. A bullose covered 100% wound and filled with serous fluid. The wound base color was 100% red with size of 1 x 1 cm and capillary refill less than 3 seconds (< 3). L's wound had no sign of infection. Similar to Case 1, the wound treatment management was also using TIME principle, T: autolytic debridement, I: wound washing with NaC1, M: wound covering with topical therapy – (Metcovazin®), hydrophilic cotton (Bunda®), and non-sterile elastic gauze bandage (Elastomull®) as fixation, E: Educating mothers on nutrition to increase body immune. Also, giving information that wound bandage should not be exposed to water during the treatment.

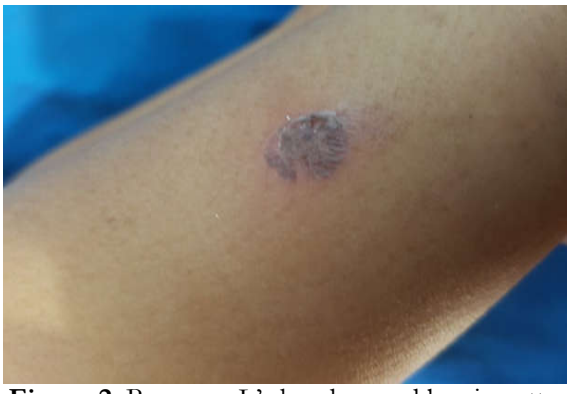

Figure 2. Burns on L's hand caused by cigarette

METHODS

Modern dressing used for wound treatment was TIME principle. The principle consisted of; T: autolytic debridement, I: washing wound with NaC1, M: covering wound with topical therapy (metcovazin®), hydrophilic cotton (Bunda®),and non-sterile elastic gauze bandage (Elastomull®) as fixation, E: educating mothers on nutrition to increase the body immune systems. There were two patients in this study who came to *Irna Wound Care* private praxis. The wound treatment was done once every three days. The treatment process was using moist wound healing with the following steps as below;

Firstly, nurse washed her hand using antiseptic fluid and wear clean medical gloves to open the old bandage. Secondly, nurse did the wound assessment and documented the progress of the wound for once every three days. Then, nurse disposed the medical gloves and washed her hand again with antiseptic. Nurse wear sterile hand gloves and washed the wound using sterile cotton and NaC1 fluid. After cleaning the wound, nurse gave metcovazin® ointment as the primary dressing and sterile cotton as the secondary dressing. Lastly, the fixation with non-sterile elastic gauze bandage (Elastomull®) was done to the wound.

RESULTS AND DISCUSSION

After doing the wound treatment three times a day using TIME principle, the patients' condition had a good progress. For case 1, D's wound had maturation in 28 days, which could be seen in figure 3 below:

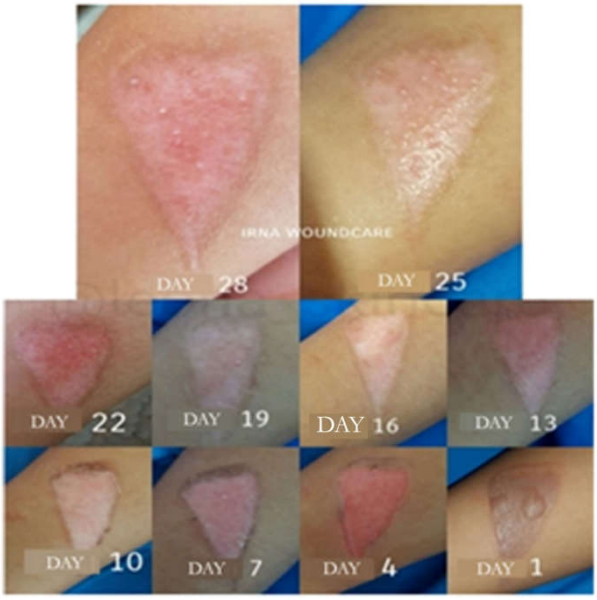

Figure 3. The progress of D' from day1 to day 28

While in case 2, L's wound showed 100% maturation condition after doing the treatment in 10 days.

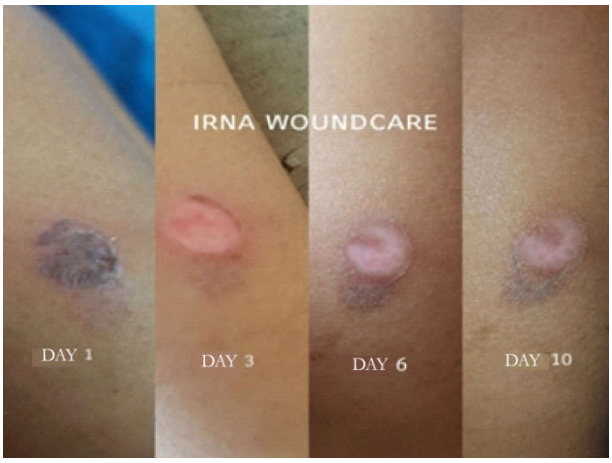

Figure 4. The progress of L's wound from day 1 to 10

In treating the burns injury, TIME (Tissue management, Inflammation & Infection control, Moisture balance, Edge) principle was used as the treatment management. This principle was able to increase the basic defense of a healthy wound, thus the wound could heal faster. The primary modern dressing used in this study was metcovazin® ointment which consisted of zinc, Vaseline and chitosan. Wardono stated that 2.5% chitosan ointment was able to fasten burns' healing time than controlling without treatment and used Vaseline only (Wardono, 2009).

There were three ways of curing the burns injury; the first way was stopping the bleeding in the early phase of burns. Based on the scientific research, chitosan fluid could completely stop the bleeding a day after it given to the wound. Chitosan grew a big amount of fibrin on the wound surface and helped the wound shrink faster (Masami et al., 2002). Chitosan was a hemostat that helped natural blood clots and blocked nerve endings to reduce the pain. Research on chitosan and heparin in early burns area showed that chitosan group had lighter burns degree result than the control group. Also, chitosan was good for preventing the spread of burns area in early phase while heparin had no influence at all to the wound (Shelma, Paul, & Sharma, 2008). It can be seen in Figure 3 which showed no expansion and no blood clots on the wound area on day 1 to day 4 treatment progress. This progress was also happened in L's case that the wound area, on day 1 to day 3, did not expand and had no blood clots, which can be seen in Figure 4.

The second way was accelerating PMN or polymorphonuclear cell in the early phase or the inflammation phase. Normally, the inflammation phase on healing process occurred for 4 until 5 days. However, in Figure 3, the inflammation phase which marked with swelling, redness and hot sensation has ended on day fourth, with no swelling, redness and hot sensation. Similar to Figure 3, the inflammation process in Figure 4 was also marked with swelling, redness and hot sensation on day first and ended up on day third. This was in accordance with the previous research that claimed the wound healing mechanism could be fasten by chitosan. It spur the activation and accumulation of PMN cell. It happened because the complement activation through alternative pathway. In this

way, a high anaphylatoxins (C3a and C5a) will be produced and had endothelium, PMN, and mononuclear (MN). The migration of PMN and MN happened after giving chitosan on the wound.

The third way was mediating the phagocytosis process or activating macrophage. This healing treatment could be seen on Figure 3 that showed the wound on day one and day four had no infection. The infection was also not found in the treatment in Figure 4, started on day one to day three. These happened because the use of metcovazin® using TIME principle could control the occurrence of infection. The result showed that apoptosis in peritoneal macrophage induced after giving chitosan and low molecular soluble chitosan. Chitosan was macrophage activator through phagocytosis mediation, hence it faster the wound healing (Masami et al., 2002).

The fourth way in treating the wound was stimulating proliferation cell and non-protein matrix server to network growth. In Figure 3, the stimulating process was started from day one to day twenty two, while in Figure 4, the process was started from day one to day ten. The proliferation cellular phase was forming the new granulation network by producing collagen and extracellular matrix protein along with increasing the vascularization to the wound. This vascularization gave nutrition which needed by the synthesis protein. Chitosan provided non-protein matrix to 3D network growth and activated the macrophage for tumoricidal activity. Chitosan also stimulated cell proliferation and organized the histoarchitectural network. Epithelialization was forming the epithelium above the skin surface. It caused cell migration on the edge of the wound in about 1 millimeter, and the epithelialization process was done more than 48 hours after getting the wound (Shelma et al., 2008). Therefore, the use of metcovazin® with TIME principle could support the re-epithelialization process.

CONCLUSION

In conclusion, the treatment management of burns injury with metcovazin® using TIME principle (Tissue management, Inflammation & Infection control, Moisture balance, Edge) was able to increase the basic defense of health wound. The composition within the metcovazin® could help quicken the curing process in healing the burns injury.

REFERENCES

Ahuja, R. B., Puri, V., Gibran, N., Greenhalgh, D., Jeng, J., Mackie, D., … van Zuijlen, P. (2016). ISBI Practice Guidelines for Burn Care. *Burns*. https://doi.org/10.1016/j.burns.2016.05.013

Gill, P., & Falder, S. (2017). Early management of paediatric burn injuries. *Paediatrics and Child Health*, *27*(9), 406–414. https://doi.org/10.1016/j.paed.2017.03.011

Horst, B. Ter, Chouhan, G., Moiemen, N. S., & Grover, L. M. (2017). Advances in keratinocyte delivery in burn wound care. *Advanced Drug Delivery Reviews*, *123*, 18–32. https://doi.org/10.1016/j.addr.2017.06.012

Kowalske, K. J. (2011). Burn Wound Care. *Physical Medicine and Rehabilitation Clinics of North America*, *22*(2), 213–227. https://doi.org/https://doi.org/10.1016/j.pmr. 2011.03.004

Masami, I., Hiromichi, O., Rui, I., Masahiro, N., Kiyotaka, W., & Seiichi, K. (2002). Effect of Liquid Chitosan in Wound Healing of Cattle. *J Clin Vet Med*, *20*(2).

Pereira, R. F., Barrias, C. C., Granja, P. L., & Bartolo, P. J. (2013). Advanced biofabrication strategies for skin regeneration and repair. *Nanomedicine*. https://doi.org/10.2217/nnm.13.50

Purdue, G. F., Arnoldo, B. D., & Hunt, J. L. (2011). Acute Assessment and Management of Burn Injuries. *Physical Medicine and Rehabilitation Clinics of North America*. https://doi.org/10.1016/j.pmr.2011.01.004

Shelma, R., Paul, W., & Sharma, C. P. (2008). Chitin nanofibre reinforced thin chitosan films for wound healing application. *Trends in Biomaterials and Artificial Organs*.

Vigani, A., & Culler, C. A. (2017). Systemic and Local Management of Burn Wounds. *Veterinary Clinics of North America - Small Animal Practice*. https://doi.org/10.1016/j.cvsm.2017.06.003

Wang, Y., Beekman, J., Hew, J., Jackson, S., Issler-Fisher, A. C., Parungao, R., … Maitz, P. K. M. (2018). Burn injury: Challenges and advances in burn wound healing, infection, pain and scarring. *Advanced Drug Delivery Reviews*. https://doi.org/10.1016/j.addr.2017.09.018

Wardono, A. . (2009). *Pengaruh Kitosan secara Topikal terhadap Penyembuhan Luka Bakar Kimiawi pada Kulit Tikus Putih (Rattus Novergicus) terinduksi Asam Sulfat*. Universitas Muhammadiyah Yogyakarta.