

Wound Care Treatment in A Case of Severe Scabies Crustacea in Patient with Stroke

Susana Widyaningsih^{1*}, D. A. Pratama², Nur Isnaini³

^{1,2,3}*Nursing School, Faculty of Health Sciences, Universitas Muhammadiyah Purwokerto*

*corr-author: susanawidyaningsih@ump.ac.id

ABSTRACT

Because of their lowered immunity and altered skin physiology, older persons are more susceptible to contracting scabies. In addition to immune system issues, aging is accompanied by changes in skin physiology, such as atrophy of the epidermis and dermis, hyperkeratosis, a diminished ability of the skin to protect against external assaults, and a delayed healing rate. A port of entry for infections is also the dry skin of the elderly. The purpose of this study is to identify the characteristic of scabies crustose patient, analyse the wound care interventions applied on patient with scabies crustose, and manage wounds in scabies crustose patients. This research was a case study is the process of assessing nursing care and analysing what interventions are given to patients for 4 days. The treatment was conducted in surgical ward, Dr. Soedirman hospital, Kebumen, Indonesia. The characteristics of the respondent in this case study is a 62-year-old woman with a diagnosis of Crustose Scabies. After treatment for 4 days, the condition of the patient's wound gradually improved, the hyperkeratotic wound on the palm of the hand which had initially thickened gradually began to thin.

Keywords: Wound Care Treatment, Scabies Crustose, Patient with Stroke

INTRODUCTION

Scabies is a skin disease caused by infestation of *Sarcoptes scabiei* variety *hominis*. According to the World Health Organization (WHO), the parasite belongs to the class arachnida, subclass acarina, order astigmata, and family sarcoptidae (WHO, 2019; Tsoi et al., 2021). Besides the *hominis* variety, *S. scabiei* has animal varieties but they only cause temporary dermatitis, are not contagious, and cannot continue their life cycle in humans (WHO, 2019; Tsoi et al., 2021). Scabies is transmitted directly by human-to-human contact, e.g. sleeping together. Mites move to a new host due to the stimulus of the new host's body odour and thermotaxis. Contact must be adequate and long enough, 15-20 minutes of direct contact. Indirect contact can occur through objects that are used interchangeably such as clothes, towels, mattresses, sheets, and pillows. The average incubation period is 4-6 weeks, but can be faster (hours to days) after the initial infestation. Itching is the main clinical symptom of scabies (Sunderkötter et al., 2021; Swe et al., 2017) Itching during the initial period of mite infestation usually occurs at night (nocturnal pruritus), in hot weather, or when sweating. Itching is felt around lesions, but in chronic scabies it can be felt throughout the body. Itching is caused by sensitization of the skin to the excretions and secretions of the mites, which are released when tunnelling. The incubation period from mite infestation until itching symptoms appear is about 14 days (Sunderkötter et al., 2021; Swe et al., 2017; Vasanwala et al., 2019).

Risk factors for scabies are overcrowding, poverty, low education level, limited clean water, and poor hygiene behaviour. Overcrowding and sleeping together are the most dominant risk factors compared to other risk factors. The high density of occupants accompanied by close interaction and physical contact facilitates the transmission of scabies (Luthfa & Nikmah, 2019; Sunderkötter et al., 2021). One stroke patient was referred to surgical ward, Dr. Soedirman hospital, Kebumen. and then later on being found that the patient was suffering from severe Scabies crustose.

The patient complaints itching all over the body which began 3 months ago. Initially, itchy spots appeared between the fingers, then the itching spread and there were pruritic lesions with hyperkeratosis accompanied by thick crusts and thickening of the nails. Itching was persistent, especially at night. The patient often scratched vigorously, causing sores in several places. The sores occurred between the fingers of both hands and arms. The sores appear at the same time as the itching caused by continuous scratching. The sores were accompanied by pain and stinging.

Physical examination revealed hyperkeratotic skin lesions with thick crusts on both palms and thickened fingernails. Lesions were found on the body and extremities. Wounds are accompanied by pain and stinging. The patient complaint of feeling pain in several body areas caused by wound lesions and itching, occasionally during sweating and at night. The patient reported the pain scale of 5. The patient had been to a dermatologist about 3 months ago for complaints of itching, had recovered but relapsed again, initially just ordinary itching, gradually expanding throughout the body. The patient said he had a history of stroke and also hypertension for 5 years. Patient's muscle is 2 (ranging from 1 – 5). Patient's grip was weak, both lower extremities were unable to fight gravity or only able to shift the foot. Therefore, patient was bedridden most of the time.

METHOD

This research was a case study conducted toward a stroke patient who suffered from severe Scabies crustose at Dr. Soedirman hospital, Kebumen, Indonesia. The treatment was conducted for four days using a set of wound care tools (sterile basin, tweezers, gauze, sterile hand gloves, personal protective equipment and linen) to solve Nursing problems related to integument system (Skin Integrity Disorders associated with Pigmentation Changes, Physical Mobility Disorders associated with Decreased Muscle Strength, and Infection Risks associated with Increased Exposure to Environmental Pathogenic Organisms) (Persatuan Perawatan Nasional Indonesia, 2023). The patient was treated with 2 topical scabicide agents: permethrin cream 5% plus mometasone 2.5 grams and a mixture of Fusidic acid 15 grams with Desoximethasone 15 grams. Permethrin cream was applied to the whole body every 24 hours at night and left on for 8 hours before rinsing. Then a mixture of 15 grams of Fusidic acid with Desoximethasone is applied to the itchy area and applied twice a day after rinsing off the Permethrin. Antibiotic (Ceftriaxone 1gr) was also given to the patient via intravenous route 2 times daily. The clinical pathway/case management is shown as in Figure 1.

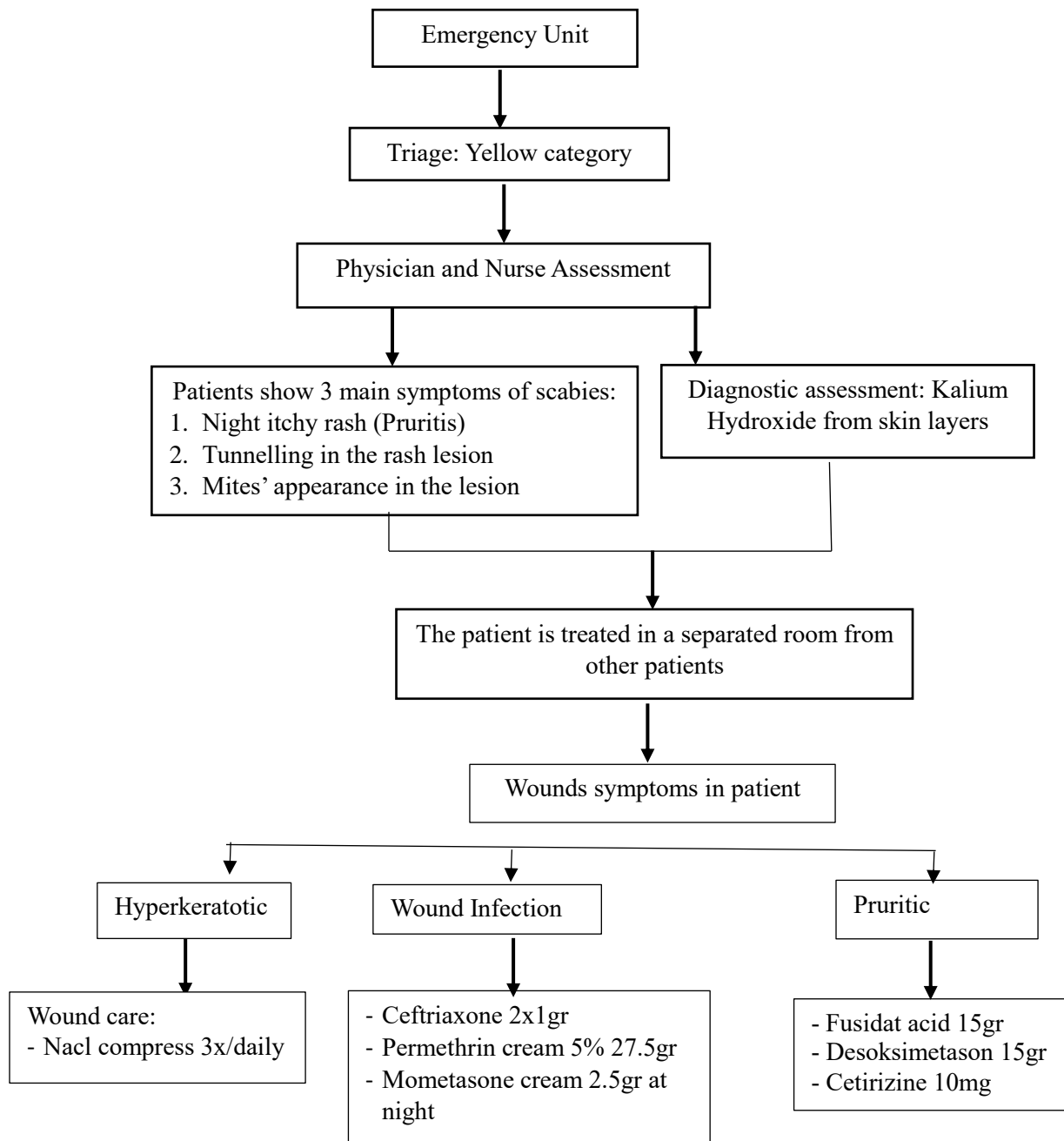


Figure 1. Clinical pathway of the patient with severe scabies crustacea

RESULTS AND DISCUSSION

1. Patient's Characteristics

Physical examination revealed patient's characteristics: blood pressure 150/92 mmHg, pulse 84 beats/min, respiration 20 beats/min, and body temperature 36°C. Furthermore, it was found that there were hyperkeratotic skin lesions with thick crusts on the palms of the hands. The lesions appeared on several parts of the body. In the axilla

sinistra, the lesions are clustered with a width of 3-4 cm, then in the right axilla, the lesions spread to the brachialis area and there is erythema around the lesions. In the neck, cubital fossa, chest, umbilicus and thoracolumbar areas, diffuse lesions also appeared. Furthermore, on the patient's forearm there is a grey wound line and there is erythema around the lesion (Figure 2).



Figure 2. Hyperkeratotic wound, day 1 of treatment

The wound condition on the 1st day of treatment appeared hyperkeratotic wounds on the palm area and also between the fingers, the wound appeared hardened and there was redness in the area around the wound and an open wound between the fingers of the left palm (Figure 3).



Figure 3. Hyperkeratotic wound, day 2 of treatment

The wound condition on day 2 of treatment appeared hyperkeratotic wounds on the part between the fingers slightly peeling with dry wound conditions and there was pink new skin tissue (Figure 4).



Figure 4. Hyperkeratotic wound, day 3 of treatment

Figure 4 shows the wound condition on the 3rd day of treatment. The wounds seemed to be getting better as evidenced by the hyperkeratotic condition on both palms getting thinner. The thickening of the skin gradually peeled off although there was still some thickening of the skin on the left palm and there was an open wound between the fingers of the left palm (Figure 5).



Figure 5. Hyperkeratotic wound, day 4 of treatment

The wound condition on the 4th day of treatment as shown in Figure 4 seemed to be gradually improving and the hyperkeratotic wounds on the right palm had peeled off and formed new pink skin tissue. Whereas on the left palm there were still some hyperkeratotic

wounds that had not peeled off and there were open wounds on the intermediate segments of the index and middle fingers .

The results of a complete blood examination on October 4, 2022 showed that the levels of Leukocytes $11.1 \times 10^3/\text{ul}$, Eosinophils 6.20%, Neutrophils 81.10%, and Absolute Neutrophil Count $8.96 \times 10^3/\text{ul}$ (High). The platelet and lymphocyte counts were low at $120 \times 10^3/\text{ul}$ and 9.20%, respectively.

2. Discussion

The principles of scabies therapy are appropriate selection and application of scabicide agents, simultaneous treatment of surrounding people, environmental decontamination and symptomatic treatment (Figure 5). The choice of scabies therapy depends on effectiveness, toxicity, type of scabies and age of the patient (Marina et al., 2022; Vasanwala et al., 2019). Elimination of mites is the primary goal of scabies management. Antihistamines and antibiotics can be given as supportive therapy in situations with severe pruritus symptoms and/or secondary infections. Permethrin 5% is still the therapy of choice for *Sarcoptes scabiei* mite elimination. Permethrin 5% is a first-line topical scabies therapy with 90% efficacy and a good safety profile. Permethrin has low toxicity in humans even when used in large enough quantities (Marina et al., 2022; Meyersburg et al., 2023; Vasanwala et al., 2019). Permethrin is minimally absorbed and rapidly metabolized. Permethrin acts specifically on arthropod nerve cells by disrupting the function of voltage gated sodium channels which results in prolonged depolarization of the nerve cell membrane, stopping neurotransmission and subsequent paralysis and death of the mite (Sunderkötter et al., 2021; Vasanwala et al., 2019).

Scabies wound care was carried out by nurses for 3 times a day using NaCl compresses on the palms of the hands. Patient also received intravenous (IV) antibiotics Ceftriaxone 2x1gr to treat the severity of infection in the wound (Figure 2). Furthermore, the patient was also given anti-histamine cetirizine 1x10 mg orally to overcome pruritic problems that made the patient uncomfortable (Perry, 2018; Vasanwala et al., 2019). Symptomatic therapy includes giving sedative antihistamines for several days to control pruritus and help patients sleep better. The medicine also helps to relieve the patient's itching condition. Intravenous antibiotic Ceftriaxone 1 gram was given as therapy to prevent secondary infection by bacteria and was given from the first day the patient was admitted until the patient was discharged (Vasanwala et al., 2019).

Topical drugs therapies (permethrin 5% 27.5 grams and mometasone 2.5 grams) were applied during the wound care and once again at night time. In the following days the doctor advised some more scabicide drugs (fusidic acid 15 grams and desoximetasone 15 grams) as topical drugs applied twice a day (Figure 2). The topical medicine is applied to all parts of the body where pruritic lesions appear (Harlim, 2019; Meyersburg et al., 2023; Vasanwala et al., 2019).

The patient had several risk factors to get Scabies transmission. She had to be bed ridden for a long time because of her scabies. Scabies can be transmitted directly or indirectly but the most common mode of transmission is through direct contact between individuals while the mites are walking on the skin surface. Direct contact is prolonged skin-to-skin contact such as sleeping together (Luthfa & Nikmah, 2019; Sunderkötter et al., 2021). However, short-term direct contact for instance shaking hands and short hugs do not contribute to mites' transmission. Scabies is more easily transmitted by direct person-to-person contact in crowded, close-knit environments such as nursing homes, orphanages, boarding schools and other institutions where residents stay for long periods of time (Sunderkötter et al., 2021; Vasanwala et al., 2019). In this case, Mrs. Smith came from a

low-income family background. Thus, her house environment as well as her personal hygiene could be some of the risk factors in mite transmission.

Indirect transmission of scabies can occur through prolonged contact with sheets, pillowcases and bolsters, clothing, blankets, towels and other household furniture infested with *S.scabiei* (Health, 2019; Manfredo et al., 2018). Indirect transmission of the mite depends on the length of time the mite can survive outside the host's body, which varies depending on temperature and humidity. On infested items, *S.scabiei* can survive 2-3 days at room temperature with 30% humidity. The higher the humidity the longer the mites survive (WHO, 2019). The source of infection in Crustose Scabies experienced by the patient cannot be determined with certainty, but it can be estimated that the patient's transmission and infection came from exposure from his child who had experienced the itching first. The results of the interview also found that the patient's house is located in a highland area which was humid. In addition, the patient's room has minimal lighting so that the possibility of humid conditions causes mites to multiply easily (Luthfa & Nikmah, 2019; Sunderkötter et al., 2021; Tsoi et al., 2021).

The initial lesion of crustose scabies is a patch of indistinctly demarcated erythema that quickly develops into diffuse hyperkeratotic plaques, especially in the palmoplantar region. This symptom can also be accompanied by erythema and scum on the face, neck, scalp and body in a generalist manner so that it appears as erythroderma. Nail abnormalities in the form of hyperkeratotic or dystrophic nails with accumulation of thick scales similar to psoriasis (Harlim, 2019). Complaints of itching all over the body at night led to the suspicion of scabies, although generally itching complaints are rarely found in crustose scabies. Norwegian or crustose scabies is a rare variant. It is characterized by erythrodermic lesions, extensive hyperkeratosis with thick crusts on the scalp, ears, elbows, knees, palms, soles, and thickened nails. This clinical picture is often confused with crusted dermatoses such as psoriasis, seborrheic dermatitis, contact dermatitis and various other causes of erythroderma. The diagnosis of Norwegian scabies was made after KOH examination of skin scraping specimens from various sites found *Sarcoptes scabiei* mites (Bernigaud et al., 2020; Vasanwala et al., 2019).

On the first day of treatment (Figure 2), complaints of itching throughout the body were still present, lesions in some places such as in the axilla, colli, cubital fossa, brachialis, umbilicus, chest and thoracolumbar were somehow thin. No new lesions were found. The wound and pain on the palm of the hands still existed (Figure 2). On the seventh day of observation (Figure 4), the patient's complaints of itching decreased, the lesions in some places thinned and the hyperkeratotic on the palms of the hands slowly peeled off and improved. Dermatologic status in the axillary region dextra et sinistra obtained thinning lesions with a width of 3-4 cm with firm boundaries. While in the axillary region, colli, cubital fossa, brachialis and umbilicus, the lesions were found to be thinned with diffuse lesion distribution. The improvement of the patient's condition were the result of the treatment combination, namely the wound care, antibiotic agents, and anti-histamine.

The Cochrane meta-analysis states that permethrin is the most effective topical agent currently with higher effectiveness than Lindan or crotamiton. Previous studies found that ivermectin given as much as 2 doses with an interval of 2 weeks had the same effectiveness as 5% topical permethrin applied once (Thadanipon et al., 2019). Others also reported that both oral ivermectin and topical permethrin found had the same effectiveness. All of these studies were conducted on classic scabies and to date there have been no studies comparing the effectiveness of oral ivermectin with other agents in crustose scabies (Nemecek et al., 2020; Thadanipon et al., 2019).

Fusidic acid is included in the class of antibiotic drugs that are effective against gram-positive bacteria. While desoxymethasone is included in the class of corticosteroid

drugs, where the use of desoxymethasone as therapy aims as an anti-inflammatory to prevent wounds from getting worse. To treat hyperkerotic palms, doctors recommend open compresses using NaCl for about 15 minutes using gauze 3 times a day. This is done because NaCl is isotonic and also physiological salt which is good for cleaning, washing and compressing wounds (El-Amawy & Sarsik, 2020; Vasawala et al., 2019). Sodium chloride (NaCl) can function to protect granulation tissue in dry conditions, and maintain moisture around the wound. The moist conditions created by the presence of NaCl in wound care can accelerate the formation of stratum corneum and angiogenesis for the wound healing process (El-Amawy & Sarsik, 2020).

CONCLUSION

The respondent in this case study was a 62-year-old woman named Mrs. S who had suffered from stroke and hypertension for 5 years. The patient was diagnosed with severe Crustose Scabies. After receiving treatment for 4 days, the patient's wound condition gradually improved, the hyperkeratotic wounds on the palms of the hands gradually began to thin out. The wound care management provided for the patient was NaCl compress three times daily. To treat crustose scabies wounds, topical permethrin 5% 27.5gr and mometasone 2.5gr were applied every night on the whole body. Furthermore, the administration of ceftriaxone 2x1gr as an antibiotic (IV route) and cetirizine 1x10 mg as an anti-histamine orally were given to eradicate the wound infection. In addition, Fusidic acid 15 grams and desoximetasone 15 grams as topical drugs were applied twice a day to relieve itchy rash or pruritic lesions.

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