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Application of Wound Care Using 0.9% NaCl Solution in Patients with Type II Diabetic Ulcers in the Wijaya Kusuma Bawah Ward of Kardinah Regional General Hospital, Tegal City

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ABSTRACT

Background & Objective: Diabetic ulcers are a condition that occurs in patients with diabetes mellitus due to nerve abnormalities and peripheral artery disorders, leading to infection in wounds and tissue damage in the skin of the feet (Roza et al., 2015). The objective of this scientific study is to apply wound care and evaluate the effectiveness of wound care using 0.9% NaCl in patients with Type II diabetic ulcers. **Method:** The method used in this scientific study is a case study. The subject of this study is one patient with Type II Diabetic Ulcer who is undergoing treatment in the Wijaya Kusuma Bawah ward of Kardinah General Hospital in Tegal City. Data collection was conducted using interview techniques, observation, and documentation. **Result:** Nursing care was provided for three consecutive days. During the assessment, it was found that the patient experienced pain in the left foot wound, which had been present since September but had not healed and had worsened. The wound was dirty, smelly, and oozing pus. The intervention provided was wound care using EBN with 0.9% NaCl, implemented over three consecutive days. By the third day, the evaluation showed that skin integrity had been restored. **Conclusion:** The author concludes that wound care using 0.9% NaCl is effective, as there was an improvement in the wound condition.

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Introduction

Diabetic ulcers are partial-thickness or full-thickness lesions that extend into the subcutaneous tissue, tendons, muscles, bones, or joints in individuals with diabetes

mellitus (DM). This condition arises due to elevated blood sugar levels. If a diabetic foot ulcer persists for a long time, is not properly managed, and does not heal, the wound may become infected.

According to the WHO (2023), diabetic ulcers have been reported in 33 countries across Africa, the Americas, Asia, and the Western Pacific. Most cases occur in tropical and subtropical regions, except in Australia and Japan. Out of the 33 countries, 14 regularly report data to the WHO. The number of suspected diabetic ulcer cases reported globally each year was approximately 5,000 in 2010, when it began to decline until 2016, reaching a minimum of 1,961 reported cases. The number of cases then began to increase again each year, reaching 2,713 cases in 2018. Since then, the number of cases has continued to decline, with 2,271 cases in 2019; 1,458 cases in 2020; and 1,370 cases in 2021.

According to Riskesdas (2018), the prevalence of diabetic ulcers in Indonesia increased to 8.5% in 2018. This figure indicates that only about 25% of diabetic ulcer patients are aware that they have diabetic ulcers. Indonesia ranks seventh among the 10 countries with the highest number of infections, with 10.7 million cases. According to the Central Java Health Profile (2021), the prevalence of diabetes mellitus in Central Java is quite high, with approximately 85% of diabetes mellitus patients experiencing diabetic ulcer complications, with an average ulcer grade of type II.

Some high-risk factors for diabetic patients developing diabetic ulcers include having diabetes for more than 8 years, being over 40 years old, having a history of smoking, decreased peripheral pulse rate, decreased sensitivity, anatomical deformities or protruding areas, and a history of foot ulcers or amputations. Diabetic ulcers are more common in Type 2 diabetes mellitus, as Type 2 diabetes typically has a longer duration, increasing the risk of complications such as nerve damage (peripheral neuropathy) and vascular damage, which are the primary factors contributing to the development of diabetic ulcers. Type 2 diabetes causes chronically elevated blood sugar levels. This condition can damage peripheral nerves (nerves in the feet and hands), causing individuals with Type 2 diabetes to experience reduced pain sensation, numbness, or abnormal sensations in the feet. Small wounds on the feet may go unnoticed by Type 2 diabetes patients due to this loss of sensation. Although diabetic ulcers can also occur in Type 1 diabetes, they are less common and are typically caused by the same factors as in Type 2 diabetes, but with different mechanisms (Erna Mardiana, 2022).

According to Haris (2009) in (Hendri, 2019), if diabetic ulcers are not properly treated, the wound healing process will be prolonged, and the risk of infection will increase. In severe cases, such as peripheral neuropathy, amputation may be necessary to prevent the infection from spreading to other tissues. Classic wound cleaning with antiseptics such as hydrogen peroxide, povidone-iodine, acetic acid, and chlorhexidine can negatively impact the body's healing process, as antiseptics not only kill bacteria but also leukocytes, which can eliminate pathogenic bacteria and inhibit fibroblast formation. Wound skin tissue is best cleaned with a saline solution, but water pressure can be used for severely contaminated wounds. A 0.9% solution is also an effective physiological fluid for wound care because it matches the salt content in the body. The function of NaCl in wound care is to moisturize the wound bed to maintain its moisture and reduce the risk of infection, particularly exudate in ulcer wounds. This solution is only intended for wound cleansing and not for long-term treatment.

Objective

The purpose of this scientific paper is to apply wound care and assess the effectiveness of wound care using 0.9% NaCl in patients with type II diabetic ulcers in the Wijaya Kusuma Bawah ward of Kardinah Regional General Hospital in Tegal City in a detailed and in-depth manner.

Method

The method used in this study is a qualitative descriptive approach based on a previous case study. The instrument used is the Medical-Surgical Nursing Care Format. The sampling technique employed is purposive sampling, with a sample size of 1 patient with Type II Diabetic Ulcers in the Wijaya Kusuma Ward of Kardinah General Hospital in Tegal City. The researcher conducted the study and implementation at Kardinah General Hospital in Tegal City on patients with diabetic ulcers on November 13-14, 2024. The data analysis in this study involved analyzing all data findings at each stage of the nursing process by comparing existing concepts and theories in nursing regarding patients with Type II diabetic ulcers. The data obtained from the nursing care process, starting from assessment, diagnosis, planning actions, implementing actions, to evaluating the results of actions, were then described and narrated in accordance with previous theories.

Results

After conducting an assessment, the following data was obtained: The client is Mr. A, 68 years old, male, with an elementary school education, and currently working as a merchant. The client was admitted to the hospital on November 13, 2024, with a medical diagnosis of diabetic abscess, also commonly referred to as diabetic ulcer. The client was accompanied by his wife, Mrs. S, aged 59, female, who works as a housewife. The client and Mrs. S have two children, one female and one male.

During the health history assessment, the client reported the main complaint post-surgery as pain in the left foot wound. The wound has been present since September but has not healed and has worsened. The wound is dirty, has an odor, and is discharging pus. The client stated that the wound was only treated with Betadine. The triggering factor for the wound was the client falling and being hit by his cart. After debridement, the client complained of pain at the surgical wound site and difficulty walking due to the pain.

During the review of past medical history, it was found that the client had no history of any illnesses because the client had never undergone a health check-up and stated that they had never been involved in an accident. Throughout their life, the client had never been hospitalized or undergone any surgical procedures. The client stated that none of his family members had a history of diabetes mellitus or other illnesses.

During the functional assessment, it was found that the client's perception and maintenance of health were that he wanted to recover quickly because he felt he was a burden to his family. The client stated that he did not know that his wound would worsen, so he only visited the community health center. He also stated that he used to eat indiscriminately before becoming ill and had a habit of eating sweet foods. The client stated that their current source of strength is their family.

During the physical assessment of Mr. A, the following findings were noted: Compos mentis (fully conscious) with a Glasgow Coma Scale (GCS) of E4V5M6, the

client's blood pressure was 160/86 mmHg, body temperature was 36.3°C with a pulse rate of 90 beats per minute and respiratory rate of 22 breaths per minute, the client's scalp was oily due to neglecting personal hygiene, The client's heart sounds were vesicular or normal, there was no tenderness in the abdominal area, there were no fractures in the extremities, an IV was inserted in the right hand, and there was a wound on the left ankle. The wound was still moist, with a degree of 2, and some bone was visible. There was tenderness in the wound area, and the skin in the wound area had begun to change color to black.

Based on the data obtained from the assessment, the author identifies the priority nursing diagnosis for Mr. A according to the SDKI, which is: Skin/Tissue Integrity Disorder related to Insufficient Exposure to Information About Efforts to Maintain/Protect Tissue Integrity, characterized by a foot ulcer.

Skin/tissue integrity impairment related to lack of information about efforts to maintain/protect tissue integrity, with the goal that after nursing interventions, skin integrity improves with the following outcome criteria: Wound healing (L.14130) Increased skin union, reduced wound inflammation, reduced pain, and reduced unpleasant odor from the wound. Interventions performed through Wound Care (1.14564): Observation: monitor wound characteristics (drainage, color, size, odor), monitor signs of infection; Therapeutic: gently remove dressings and bandages, clean with NaCl solution or non-toxic cleanser as needed, remove necrotic tissue; apply appropriate ointment to the skin, if necessary, apply dressing according to the wound, maintain sterile technique during wound care, Education: explain signs and symptoms of infection, recommend consuming high-calorie and protein-rich foods, teach self-care wound care procedures, Collaboration: collaborate on debridement procedures (enzymatic, biological, mechanical), collaborate on antibiotic administration, if necessary.

Discussion

Assessment is the initial stage using the nursing process and is a systematic process of collecting data from various sources, namely the patient, family, ward nurse, patient status, and direct observations of the patient. The author conducted an assessment of Mr. A, a 68-year-old male with an elementary school education who currently works as a merchant. The client was admitted to the hospital on November 13, 2024, complaining of pain in the left leg wound. The wound had been present since September but had not healed and had worsened. The wound was dirty, smelly, and oozing pus. The client stated that the wound had only been treated with Betadine. An IV was inserted into the right hand, and there was a wound on the left ankle. The wound was still moist, with a wound depth of 2 cm, exposing some bone. There was tenderness in the wound area, and the skin around the wound had begun to change color to black. According to Haris (2009) in (Hendri, 2019), if this diabetic ulcer wound is not properly cared for, the wound healing process will be prolonged, and the risk factors for infection will increase. If the infection is too severe, such as in cases of peripheral neuropathy, amputation may be necessary to prevent the infection from spreading to other tissues.

Based on the data found in the assessment, the author identified the priority nursing diagnosis for Mr. A according to the SDKI, which is: Skin/Tissue Integrity Disorder related to Insufficient Exposure to Information About Efforts to Maintain/Protect Tissue Integrity, characterized by a foot ulcer. Skin integrity damage

(dermis and/or epidermis) or tissue damage (mucous membranes, cornea, fascia, muscle, tendon, bone, cartilage, joint capsule, and/or ligament) (SDKI, 2017).

According to (PPNI, 2018), after conducting the assessment process and formulating the nursing diagnosis, the author established a plan to address the identified issues. During the planning stage, the author develops a nursing action plan based on the priority diagnosis identified, which is Skin Integrity Impairment. The author sets objectives in the plan according to the Indonesian Nursing Outcomes Standards (SLKI), determines interventions based on the Indonesian Nursing Intervention Standards (SIKI), and provides rationales using various literature sources. In addition to using SIKI (2018) as a reference in developing interventions, the author also utilized a systematic review reviewed by Andi Suriani (2023) on the Application of Wound Cleaning Using 0.9% NaCl. To Prevent Skin Integrity Damage in Patients with Diabetic Ulcers, stating that the application of wound care using 0.9% NaCl to prevent skin integrity damage in diabetic ulcer patients is effective because the ulcer wound has formed new red tissue in the center of the ulcer, and the amputation suture site on the little finger has dried.

The implementation carried out by the author was wound care using EBN with 0.9% NaCl, and the results on the third day of implementation were that wound cleaning was repeated using 0.9% NaCl solution with the same technique as the first time, and the wound condition remained the same as the previous day: clean, no pus, no odor, and red in color. The intervention was discontinued on the third day of care because the client was permitted to return home as their condition had begun to improve. Based on Sepia Putri's (2024) study on the application of wound care for diabetic ulcers using 0.9% NaCl solution in diabetic patients at PKU Muhammadiyah Hospital in Karanganyar, 0.9% NaCl solution is recommended as a wound cleanser because normal saline solution has the same composition as blood plasma, making it safe for the body. As a result, the pain in the foot decreased, and the skin appeared clean and moist.

The study conducted by the researcher on patients with Skin/Tissue Integrity Disorders showed changes from initially being dirty to clean and red in color. The wound initially discharged pus, but after 4 days of treatment, it no longer discharged pus, and the initial odor disappeared. Therefore, the researchers concluded that there is effectiveness in the treatment of diabetic ulcers using 0.9% NaCl solution on clients with Skin/Tissue Integrity Disorders. This aligns with the findings that Skin/Tissue Integrity Disorders showed changes from initially being dirty to clean and red in color, with wounds initially discharging pus, and after 4 days of treatment, no longer discharging pus, and initially having an odor, which became odorless. Therefore, the researchers concluded that there is effectiveness in the treatment of diabetic ulcers using 0.9% NaCl solution on clients with skin/tissue integrity disorders.

Conclusion

Based on the research conducted by the researchers, it was concluded that: After reviewing previous research journals, it was found that the treatment of type II diabetic ulcers using 0.9% NaCl is effective for the healing process of diabetic ulcers. The function of NaCl used as wound care is to moisturize the wound bed to maintain its moisture and reduce the risk of infection. There is effectiveness in wound care using 0.9% NaCl in patients with Type II diabetic ulcers because the wound becomes clean, odorless, and does not discharge pus.

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