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Modern Dressing Applications Use *Hydrogel* as Autolysis Debridement In Patients *Diabetic Ulcer*

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ABSTRACT

Objective: This study was conducted to present a wound care intervention using Hydrogel dressing in diabetic ulcer patients with the principle of Modern dressing to speed up the wound recovery process.
Method: This study used the nursing care method, including assessment, formulating nursing diagnoses, interventions, implementation and evaluation which were carried out for 6 days with 3 meetings at the patient's house located at Kp Benteng Kel Sukamenak, Purbaratu District. Enforcement of nursing diagnoses refers to the Indonesian Nursing Diagnosis Standards (SDKI). Indonesian Nursing Intervention Standards (SIKI), Indonesian Nursing Outcome Standards (SLKI), and nursing evaluations are documented using the SOAPIER method.
Result: Provision of wound care interventions using Hydrogel with the principle of Modern dressing has proven to be useful for improving the wound healing process of Diabetic Ulcers, the benefits of this application will be maximized if done regularly and gradually.
Conclusion: : Based on the entire series of nursing care processes that the author carried out on Ny. H with the problem of infection risk associated with Diabetic Ulcers the authors can draw the conclusion that hydrogel administration as debrilytic Autolysis has significant results in 6 days with 3 meetings.

Keywords: Diabetes Mellitus, Diabetic Ulcer, Hydrogel, Modern Dressing

Introduction

Diabetes Mellitus is a chronic disease characterized by blood glucose levels that exceed normal (Ridwan et al., 2014). An imbalance of glucose in the blood has a disruptive effect on neuropathy which causes diabetic ulcers (Hidhayah et al., 2021). One of the complications of Diabetes Mellitus is an ulcer which causes 50% to 75% to have to be amputated (Ose et al., 2018). Wound care has experienced very rapid development, especially in the last two decades. The latest wound care technique "Moist Wound Healing". One of them is by using modern MSGA formulation dressings (Budiman et al., 2020).

Diabetes Mellitus is one of the main health problems in modern society in the world (Rosyid et al., 2019). The International Diabetes Federation (IDF) noted that in 2017 the number of people with Diabetes Mellitus in the world reached 425 million adults aged 20-79 years and it is estimated that by 2045 there will be 629 million people (Ramadhanti, 2020). WHO (World Health Organization) noted in 2016, in the Southeast Asia region in 2016 there were 415 million adults with Diabetes Mellitus. The prevalence of Diabetes Mellitus in Indonesia based on RiskesDas in 2013 was 1.5% and in 2018 it was 2.0%. In Central Java in 2013 it was 1.7%, but in 2018 it increased to 2.2% (Rahmah & Parinduri, 2020).

The results of the recapitulation from the West Java Health Service in 2020 on the West Java open data website, states that Diabetes Mellitus in West Java has experienced a significant increase, namely 21.36% from 2019 totaling 848,455 to 1,078,857 people, in the last two years had an average value of 963,656 people, the highest cases were in Bekasi district totaling 242,169 people and the lowest were in the city of Banjar totaling 2,340 people (Dinas Kesehatan, 2020).

Diabetic Ulcer is an open sore on the skin layer down to the dermis. More than half of non-traumatic amputations are the result of complications of diabetic ulcers. Even after good wound healing treatment results, the recurrence rate is estimated to be around 66%, and the risk of amputation increases to 12% (Maigoda, 2022).

Wound dressing techniques developed very quickly. The old principle says that wound care must be done in dry conditions actually makes wound healing take longer because it inhibits cell and collagen proliferation, but conditions that are too wet will cause maceration around the wound (Purwanto, 2018). Wound care using the principle of balanced moisture (moisture balance) is known as the Modern dressing method and uses a more modern dressing dressing (Nurcahyani, 2018). Currently, more than 500 types of modern wound dressings are available to treat patients with chronic wounds, including hydrogels, hydrocolloids, calcium alginate, foam or absorbent dressings, anti-microbial dressings(Mahendra, 2022).

Research conducted by (Handayani, 2016) using mann whitney with alpha level = 0.05 obtained p = 0.00 with a mean rank of 3:1, which means that Hydrogel is three times more effective than 0.9% NaCl in healing Diabetic Ulcers. This study proves that the use of Hydrogel in healing Diabetic Ulcers is more effective. It is important to understand that a moisturizing dressing is a dressing that can maintain a simple moist environment(Aminuddin et al., 2020).

There are many types of dressings that can retain moisture in the wound. Some of the ingredients in modern dressings include Hydrogel which functions to moisturize dry wounds, hydrocolloid moisturizes the wound bed for the autolysis debridement process, transparent water-repellent film and maintains wound moisture and protects the skin from irritation, calcium alginate which functions to absorb wound fluids and stop minor bleeding, hydrocelulosa functions in moisture and absorbs wound fluid, foam dressing functions to retain moisture and absorb large amounts of fluid and herbal ointments which also function to moisturize wounds. Changing the dressing is done every 2-3 days to speed up the process of reducing the bacteria that multiply (Amiatussolihah, 2021).

Based on this background, wound care using the principle of balanced moisture (moisture balance) or known as the modern dressing method is very important for patients with diabetic ulcers because it can speed up the wound healing process. So the researcher is interested in conducting research on "Application of Modern Dressing Using Hydrogel as Debrilytic Autolysis in Diabetic Ulcer Patients"

Objective

The purpose of this case study is to document wound care using the Hydrogel formulation for wound healing in Diabetic Ulcer patients.

Method

The research design used by the author is a case study with a nursing care approach where this research is carried out by collecting data starting from processing descriptive data, such as interview transcripts, field notes, pictures, photos, video recordings, formulating diagnoses, planning, implementing action and intensive evaluation. This case study uses a descriptive method with the main objective to explore the problem, providing an overview of the case study by analyzing more deeply about nursing care with the application of wound care interventions to improve the process of debrilytic autolysis in diabetic ulcer patients.

Results

The results of a study of giving modern dressing therapy to diabetic ulcer patients as debrilytic autolysis on June 19, 2023 for 6 days at the patient's home obtained the following results.

Assessment

Based on the results of a study conducted on Mrs. H on June 9, 2023 it was found that Mrs. H., 65 years old, said that the client had a wound that would not heal. The client said that he had previously treated his leg wound at the Purbaratu District Health Center. Then further treatment is carried out at home assisted by his family. When the study was carried out on June 9, 2023 at 14.00 WIB. The client said the wound he was experiencing at this time had occurred 1 month ago and had not healed. The client said the location of the wound was on the left big toe. With a wound degree of 2.

Diabetic Ulcer manifestations can be seen by stage. According to Hestiana (2017) the signs and symptoms of Diabetic Ulcers are:

1. Stage I shows signs that are not typical, which are like tingling, the feet become cold and thick.
2. Stage II shows decreased sensation in the feet.
3. Stage III represents pain at rest.
4. Stage IV shows tissue damage (necrosis), dry skin

At the time of the assessment the client said there was a wound on the big toe of his left foot. The client appeared to be complaining about his wound that did not heal, when examined the wound appeared black on the patient's left big toe stage IV, and smelled an odor with a degree of injury 2. The results of vital signs measurements obtained blood pressure 130/90 mm Hg, pulse 80 beats/minute, respiration 20 beats/minute and temperature 36.2˚C. the results of the physical examination obtained the quality of the Glasgow Coma Scale (GCS) compos mentis client with the quantity of Eye 4, Motoric 6, and Verbal 5. Muscle strength of the client's upper right limb 5, upper left 5, lower right limb 5 and lower left 5.

Nursing diagnoses

Based on the results of the studies that have been obtained, conclusions can be drawn to determine the nursing diagnosis for the client, namely the risk of infection associated with diabetes mellitus wounds.

In this case the researcher raised the diagnosis of infection risk because the patient said he had a wound that did not heal and the wound was smelly and black, after cleaning the wound had a degree of Type 2 Diabetic Ulcer wound.

Nursing Intervention

Nursing plans are made according to the problems that arise in clients, namely: wound care, with the aim of assessing and improving wound healing and preventing complications from occurring in wounds by using Hydrogel dressings.

Table 1. Nursing Interventions

Nursing Diagnosis (Purpose, Outcome Criteria)	Intervention	Rational
Risk of infection (D.0142)related to injuries*Diabetes mellitus* Objective: After being given nursing actions for 3x24**infection rate (L14137)**decrease. Results Criteria: 1. Foul smelling liquid ↓ 2. The culture of the wound area is improving 3. Increased hand hygiene	**Wound care (1.14564)** Observation 1. Monitor wound characteristics (eg color, degree of injury, odor) 2. Monitor for signs of infection Therapeutic 3. Injury cure 4. Maintain sterile technique 5. Describe the signs and symptoms of infection 6. Teach wound care procedures independently	1. In order to know the condition of the wound 2. In order to know the signs of infection 3. In order to avoid infection 4. so that infection does not occur 5. To make the client aware of the signs and symptoms of infection 6. so that clients and their families can perform wound care independently.

Hydrogel is a modern dressing that supports the effective process of autolytic wound debridement. Hydrogel as debrilytic autolysis, which is a process of decaying necrotic tissue carried out by the body itself. Hydrogel is used as a primary dressing and requires a secondary dressing (gauze and transparent film). This topical is used for necrotic or black or yellow wounds with minimal or no exudate.

Nursing Implementation

Implementation of nursing given in accordance with nursing interventions that have been designed according to client needs. During the implementation of nursing, the author also involves the family in its implementation, it is intended that families and clients are able to do it independently.

On the first day the researchers checked the patient's blood sugar levels which were still high, so the researchers not only provided wound care but also provided education

regarding diabetes diet, with the aim that the patient's blood sugar decreased quickly so that the wound care process could be accelerated.

Discussion

Based on the results of implementation for 6 days with 3 visits, it was found that there was significant progress in wound recovery in clients with Diabetic Ulcer wounds. Before the researchers conducted an assessment of the client on June 9 2023, it was found that the client complained that there was a wound on the big toe on the left side, the wound occurred a month ago, then had been examined at the local health center one week ago and was advised to treat the wound at home , but the family does not understand how to treat wounds and are still afraid to treat diabetes mellitus wounds. Researchers provide wound care interventions with the Modern dressing method using hydrogel. The results were black, smelled fishy, there were signs of infection with a degree of wound 2.

At the 2nd meeting there was a very visible change in the client, with the result that the wound was not too smelly, starting to turn yellow so that the risk of infection decreased. Furthermore, the researchers provided wound care back to the patient so that the wound would improve quickly.

At the 3rd meeting the researchers also involved their families to pay attention to the wound care process, so that further interventions could be continued with their families. At the time of evaluation of the wound, there were changes, starting with slight granulation, which indicated that the wound had healed quickly.

Researchers also evaluated the changes from the first meeting to the 3rd meeting by providing interventions giving Modern dressings using hydrogel as debrilytic autolysis, significant changes were obtained in the wound that occurred in Mrs. H in Kp Benteng Kel Sukamenak, Purbaratu District, Tasikmalaya City.

The results of the intervention are supported by the results of research conducted by (Rika & Elvi, 2016) that Gel is very good at creating and maintaining a moist wound healing environment and is used in wound types with little drainage.

In addition, in research conducted by (Purnomo et al., 2014) in Semarang City Hospital From the results of data analysis using the Mann-Whitney U test with a significance level of 5%, it was obtained a value = 0.000 with a calculated Z value of 6.482 and a mean rank of 45.08:15.92 (3:1) meaning that Hydrogel is more effective than 0.9% NaCl in wound healing DM Ulcers in RSU Semarang City. Ulcer wound repair with Hydrogel decreased by a mean of 10-13 points while the use of 0.9% NaCl only decreased by a mean of 2-3 points in 9 days (Bates-Jansen Scale).

On research (Sari et al., 2022) It was also found that hydrogel dressings can increase epithelialization and accelerate wound healing. Hydrogel dressings have the advantage of shorter replacement times every 3 days and also have a healing period of 21-85 days for stage II, III, and IV pressure sores.

Conclusion

Based on the entire series of nursing care processes that the author carried out on Ny. H with the problem of infection risk associated with Diabetic Ulcers the authors can draw the conclusion that hydrogel administration as debrilytic Autolysis has significant results in 6 days with 3 meetings.

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Daftar Pustaka

1. Amiatussolihah, A. (2021). Lite*ratur REVIEW: Gambaran Efektivitas Penggunaan Balut Luka Modern Pada Pasien Ulkus Kaki Diabetik*. Universitas_Muhammadiyah_Mataram.
2. Aminuddin, M., Sholichin, S. K., Kep, M., & Sukmana, N. M. (2020). Modul Perawatan Luka. *Samarinda: Program Studi Diploma Iii Keperawatan Fakultas Kedokteran Universitas Mulawarman*.
3. Budiman, A., Amir, Y., & Nurcahyati, S. (2020). Gambaran tingkat pengetahuan dan sikap perawat terhadap perawatan luka terkini. *Jurnal Keperawatan BSI*, *8*(2), 231–238.
4. Dinas Kesehatan. (2020). *Jumlah Penderita Diabetes Melitus Berdasarkan Kabupaten/Kota di Jawa Barat*. https://opendata.jabarprov.go.id/id/dataset/jumlah-penderita-diabetes-melitus-berdasarkan-kabupatenkota-di-jawa-barat
5. Handayani, L. T. (2016). Studi meta analisis perawatan luka kaki diabetes dengan modern dressing. *The Indonesian Journal of Health Science*, *6*(2).
6. Hidhayah, D. A., Kamal, S., & Hidayah, N. (2021). Hubungan lama sakit dengan kejadian luka pada penderita Diabetes Melitus di Kabupaten Magelang. *Borobudur Nursing Review*, *1*(1), 1–11.
7. Mahendra, A. (2022). *Pengaruh Moist Wound Healing Terhadap Kondisi Luka Pada Kaki Pasien Penderita Ulkus Diabetikum Di Wijaya Wound Care Kabupaten Demak*. Universitas Islam Sultan Agung Semarang.
8. Maigoda, T. C. (2022). *Gel Ekstrak Daun Jambu Biji dan Daun Senduduk: Dampaknya terhadap Penanda Inflamasi, Bakteriologis, Diameter Luka, dan Kolagen pada Luka Kaki dengan Diabetes*. Penerbit NEM.
9. Nurcahyani, D. D. W. I. (2018). *Body Image Pasien Diabetes Millitus Yang Mengalami Ganggren Di RSUD dr. Sayidiman Magetan*. Universitas Muhammadiyah Ponorogo.
10. Ose, M. I., Utami, P. A., & Damayanti, A. (2018). Efektivitas perawatan luka teknik balutan wet-dry dan moist wound healing pada penyembuhan ulkus diabetik. *Journal of Borneo Holistic Health*, *1*(1), 101–112.
11. Purnomo, S. E. C., Dwiningsih, S. U., & Lestari, K. P. (2014). Efektifitas Penyembuhan Luka Menggunakan NaCl 0,9% dan Hydrogel Pada Ulkus Diabetes di RSU Kota Semarang. *Prosiding Konferensi Nasional II PPNI Jawa Tengah*, 144–152.
12. Purwanto, E. (2018). *Efektivitas Ekstrak Cabai Rawit (Capsicum Frutescens L) Terhadap Penyembuhan Luka Insisi Pada Mencit (Mus musculus)*. Universitas Airlangga.
13. Rahmah, L., & Parinduri, S. K. (2020). Evaluasi Standar Pelayanan Minimal Pengendalian Diabetes Melitus Di Puskesmas Bogor Utara Kota Bogor Tahun 2019. *Promotor*, *3*(3), 269–281.
14. Ramadhanti, W. (2020). *Aplikasi Modern Dressing: Hydrogel Sebagai Autolisis Debrilitik Pada Pasien Ulkus Diabetik*. Diploma, Universitas Muhammadiyah Magelang.
15. Ridwan, A., Astrian, R. T., & Barlian, A. (2014). Pengukuran efek antidiabetes polifenol (polyphenon 60) berdasarkan kadar glukosa darah dan histologi pankreas mencit (Mus

musculus l.) sw jantan yang dikondisikan diabetes mellitus. *Jurnal Matematika Dan Sains*, *17*(2), 78–82.
16. Rika, F., & Elvi, O. (2016). Aplikasi Modern Wound Care Pada Perawatan Luka Infeksi di RS Pemerintah Kota Padang. *Nurse Jurnal Keperawatan*, *12*(2), 159–165.
17. Rosyid, F. N., Hudiawati, D., & Kristinawati, B. (2019). Peningkatan pengetahuan dan upaya pencegahan diabetes melitus melalui pendidikan kesehatan. *J-ADIMAS (Jurnal Pengabdian Kepada Masyarakat)*, *7*(2), 91–94.
18. Sari, S. I., Andas, A. M., & Wada, F. H. (2022). Efektivitas Hidrogel Terhadap Penyembuhan Luka Pada Pasien Pressure Ulcer. *Jurnal Ilmiah Keperawatan IMELDA*, *8*(1), 52–57. https://doi.org/10.52943/jikeperawatan.v8i1.688