

Effect of Hydrogel as Autolysis Debridement Media on Wound Healing in Diabetic Ulcer Patients in Holistic Homecare

Muchammad Ubaidi¹, Sumedi²

Nursing Study Program, Indonesia Maju University^{1,2}

Jl. Harapan nomor 50, Lenteng Agung – Jakarta Selatan 12610

Email: muchammadubaidi@gmail.com¹

Research Article

Volume: 02

Issue: 01

Years: 2023

Editor: IJ

Received: 19/01/2023

Reviewed: 30/01/2023

Published: 04/02/2023

Available Article: (doi)
10.53801/jcn.v2i1.98

Copyright: ©2023 This article has open access and is distributable under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the name of the author and the original source are included. This work is licensed under a **Creative Commons Attribution-Share Alike 4.0 International License**

Abstract

Background: Applying hydrogel as a topical dressing in modern wound care which will help the autolysis debridement process, so that patients feel comfortable in the wound care process.

Objectives: To Knowing the description of Wound Healing in Diabetic Ulcer Patients before and after Hydrogell Administration.

Methods: Pre-test and post-test research was used in a quasi-experimental research design. Before measuring the wound, the first activity in the follow-up of this study was giving a pre-test. A final post-test was administered following the hydrogel administration procedure to compare the wound before and after treatment.

Results: After the statistical test was carried out, the p-value = 0.000 (p-value <0.05), and the t result was 22.477. This shows the effect of Hydrogell as an autolytic debridement medium on wound healing in diabetic ulcer patients. Which means H₀ is rejected and H_a is accepted.

Conclusion: Based on the results of research conducted that there is effectiveness of Hydrogell for autolysis debridement in the wound healing process in diabetic ulcer patients.

Keywords: autolysis debridement, diabetic ulcer, hydrogell

Introduction

One type of chronic wound is a diabetic ulcer, an open wound on the skin layer down to the dermis.^{1,2,3} Diabetic ulcer complications account for more than half of non-traumatic amputations.^{4,5,6} The risk of amputation increases to 12% and the recurrence rate is estimated to be around 66% even after successful wound healing treatments.^{7,8,9} Because of this, it is necessary to carry out nursing care for patients with impaired skin integrity caused by chronic wounds by applying hydrogel as a topical dressing in modern wound care which will help the autolysis debridement process, so that patients feel comfortable in the wound care process.^{10,11,12}

Method

The pre-test and post-test studies were used in a quasi-experimental research design.^{13,14} Before measuring the wound, the first activity in the follow-up of this study was given a pre-test. A final post-test was administered following the hydrogel administration procedure to compare the wound before and after treatment. This study uses Total Sampling as a sampling method; the sample consists of 27 respondents.

Research result

Univariate Test Analysis

Table 1. Wound Healing in Diabetic Ulcer Patients before Administration of Hydrogel as Autolysis Debridement Media (n = 27)

Mean	SD	Wound Degeneration	Wound Regeneration	Wound Healing
51.93	4.682	29,6 %	70,4%	0%

Based on table 1, it is known that the mean value of wound healing in Diabetic Ulcer Patients before administration of Hydrogel as an Autolysis Debridement medium was 51.93 with benchmark values: 1-13 = Wound healed, 14-54 Wound regeneration, 55 □ Wound Degeneration, 29.6 % Respondents or 8 people experienced wound aggravation while the remaining 70.4% experienced a wound repair process with a standard deviation of 4,682. Wound Healing in Diabetic Ulcer Patients after Administering Hydrogel as an Autolysis Debridement Media.

Table 2. Wound Healing in Diabetic Ulcer Patients after Administering Hydrogel as Autolysis Debridement Media (n = 27)

Mean	SD	Wound Degeneration	Wound Regeneration	Wound Healing
25.04	4.238	0 %	100 %	0%

Based on table 2, it is known that the mean value of wound healing in Diabetic Ulcer Patients after administration of Hydrogel as an Autolysis Debridement medium is 51.93 with benchmark values: 1-13 = Wound healed, 14-54 Wound regeneration, 55 □ Wound Degeneration, 100% of respondents underwent a wound repair process with a standard deviation of 4,238.

Bivariate Test Analysis

Table 3. The Effect of Hydrogel as an Autolysis Debridement Media on Wound Healing in Diabetic Ulcer Patients (N = 27)

No	Scale	Mean	Mean Differences	T-test	p
1.	Pre-test intervention group	51.93		22.477	
2.	Post-test intervention group	25.04			

Table 3 shows that the average wound healing before the administration of hydrogel was 51.93, and after being given hydrogel, the average wound healing value was 25.04. Meanwhile, the difference in wound healing pre-test and post-test was 26,889. with benchmark values: 1-13 = Wound healing, 14-54 Wound regeneration, 55 □ Wound Degeneration. After the paired t-test was performed, the p-value = 0.000 (p-value <0.05), and the t-result was 22,477. This shows that there is an effect of Hydrogell as an autolysis debridement medium on wound healing in diabetic ulcer patients.

Discussion

Univariate analysis

Description of Wound Healing in Diabetic Ulcer Patients before Administering Hydrogell as an Autolysis Debridement Media Based on research results it is known that the mean value of wound healing in diabetic ulcer patients before administration of hydrogel as an autolysis debridement medium is 51.93 with a standard deviation of 4.682. This shows that the condition of the diabetic wound is an ulcer in Grade II. Grade 2 diabetic foot ulcers are characterized by sores radiating to the tendons and bones but there is minimal infection. Based on the results of the study, it is known that the mean value of wound healing in Diabetic Ulcer Patients after Administering Hydrogell as an Autolysis Debridement medium is 25.04 with a standard deviation of 4.238 concerning the total value of the BWAT assessment results: value: 1-13 = Wound healed, 14 -54 Wound regeneration, 55 □ Wound Degeneration.

This is supported by the opinion of Kamal, Sodiq, (2015) Hydrogel has a role to remove dead or necrotic tissue naturally by autolysis debridement based on glycerin or water. Apart from softening or destroying necrotic tissue without damaging healthy tissue, Hydrogell also functions to create a moist environment or atmosphere in the wound.¹⁵

Based on the results of the research above, the researcher assumes that before administering hydrogel the average score is 51.93 which means that some wounds are entering the regeneration phase and some are in the degeneration phase, so modern wound care is needed with the moist concept, one of which is by applying hydrogel to maintain moist conditions. on the wound area

Bivariate Analysis

After the paired t-test was performed, the p-value = 0.000 (p-value <0.05), and the t-result was 22,477. This shows that there is an effect of Hydrogell as an Autolysis Debridement medium on wound healing in Diabetic Ulcer Patients. These results are in line with the research results of Khoirunisa's research, (2020) which showed that after modern treatment was carried out at Wocare Bogor with hydrogel, metcovazin, hydrocolloid, a significant p-value of 0.000 was obtained, meaning that modern dressings were able to reduce the average wound healing score. Another research that is in line is Pratiwi's study, (2020) which showed that hydrogel-containing snakehead fish extract was effective in healing grade II wounds in patients with type II diabetes mellitus from the results of a paired t-test with a significance value of p = 0.000.

According to the assumption of the researchers, there is autolysis debridement caused by the method of wound care with a hydrogel which functions to maintain and maintain the humidity or moist balance of the environment around the wound so that it increases the process of decay of necrotic tissue, and increases the process of growth of wound tissue. In addition, Hydrogel also has the function of destroying and softening necrotic tissue without damaging the tissue around the wound which is still good, then the soft tissue will be absorbed into the hydrogel structure and carried along with the dressing. Topical hydrogel dressings can be applied for 3 – 5 days, thereby reducing the risk of trauma and pain during wound care or the process of changing dressings.

Conclusion

Based on the results of the study and the description of the discussion above, the researcher can draw the following conclusions: Description of wound healing in Diabetic Ulcer Patients before Hydrogell Administration as an Autolysis Debridement medium by referring to the total value from the results of the BWAT assessment: value: 1-13 = Wound healed, 14 -54 Wound regeneration, 55 □ Wound Degeneration, an average of 51.93 with a standard deviation

of 4.682; Description of Wound Healing in Diabetic Ulcer Patients after Administering Hydrogell as an Autolysis Debridement medium by referring to the total value of the BWAT assessment results: score: 1-13 = Wound healed, 14-54 Wound regeneration, 55 □ Wound Degeneration, average of 25.04 by the standard deviation of 4,238; and There is an Effect of Hydrogel Administration as an Autolysis Debridement Media on Wound Healing in Diabetic Ulcer Patients with a significance value of $p=0.000$.

References

1. International Diabetes Federation. IDF Diabetes Atlas Ninth Edition 2019. Vol. 266, The Lancet. 2019.
2. Parker K. Living with diabetes. Infobase Publishing; 2007.
3. Dimantika A, Sugiyarto S, Setyorini Y. Perawatan Luka Diabetes Mellitus Menggunakan Teknik Modern Dressing. *Interes J Ilmu Kesehatan*. 2020;9(2):160–72.
4. Purnomo SEC, Dwiningsih SU, Lestari KP. Efektifitas Penyembuhan Luka Menggunakan NaCl 0, 9% dan Hydrogel Pada Ulkus Diabetes Mellitus di RSUD Kota Semarang. In: *PROSIDING SEMINAR NASIONAL & INTERNASIONAL*. 2014.
5. Subandi E, Sanjaya KA. Efektifitas modern dressing TERHADAP proses Penyembuhan Luka diabetes melitus TIPE 2. *J Kesehatan*. 2019;10(1):39–50.
6. Khoirunisa D, Hisni D, Widowati R. Pengaruh modern dressing terhadap skor penyembuhan luka ulkus diabetikum. *NURSCOPE J Penelit dan Pemikir Ilm Keperawatan*. 2020;6(2):74–80.
7. Haskas Y, Restika I. Evaluasi Ragam Metode Perawatan Luka Pada Pasien Dengan Ulkus Diabetes: Literature Review. *J Keperawatan Prior*. 2021;4(2):12–28.
8. Rismayanti IDA, Sundayana IM, Pratama PE. Penyembuhan luka grade 2 pada pasien diabetes mellitus dengan Modern Dressing Wound Care. *J Keperawatan Silampari*. 2020;4(1):222–30.
9. Nursalam D. *Manajemen Keperawatan" Aplikasi dalam Praktik Keperawatan Profesional*. 5th Editio. Jakarta Selatan: Salemba Medika; 2015.
10. Yolanda O, Utomo W, Sabrian F. Efektifitas Minyak Zaitun Terhadap Pressure ulcers pada Pasien dengan Tirah Baring Lama. 2013;
11. Nurbaya N, Tahir T, Yusuf S. Peranan Pencucian Luka Terhadap Penurunan Kolonisasi Bakteri Pada Luka Kaki Diabetes. *J Keperawatan Muhammadiyah*. 2018;3(2).
12. Indonesia PE. *Pengelolaan dan pencegahan diabetes melitus tipe 2 di Indonesia*. Pb Perkeni. 2015;
13. Sugiyono. *Metode penelitian kuantitatif kualitatif dan r&d*. Bandung, Jawa Barat: Alfabeta; 2016.
14. Notoatmodjo S. *Metodologi penelitian kesehatan*. 2012;
15. Kamal S. Implementasi Perawatan Luka Modern Di Rs Harapan Magelang. In: *Prosiding Seminar Nasional & Internasional*. 2015.