

Comparison of Mandakini Dressing Vs Standard Dressing for Diabetic Foot Ulcers

Subhadarsini Mohapatra¹, Abhinav Deep², Ghilman Zafar³, Sanjeeva Kumar Choudhary⁴, Ved Rajan Arya⁵, Sarfaraz Nawaz⁶, Sharad Syangden⁷

¹PGT 3, Department of General Surgery, MGM Medical College & LSK Hospital, Kishanganj, Bihar, India

²PGT 3, Department of General Surgery, MGM Medical College & LSK Hospital, Kishanganj, Bihar, India

³PGT 3, Department of General Surgery, MGM Medical College & LSK Hospital, Kishanganj, Bihar, India

⁴Professor, Department of General Surgery, MGM Medical College & LSK Hospital, Kishanganj, Bihar, India

⁵Professor, Department of General Surgery, MGM Medical College & LSK Hospital, Kishanganj, Bihar, India

⁶Assistant Professor, Department of General Surgery, MGM Medical College & LSK Hospital, Kishanganj, Bihar, India

⁷Assistant Professor, Department of General Surgery, MGM Medical College & LSK Hospital, Kishanganj, Bihar, India

Received: 25-12-2022 / Revised: 25-01-2023 / Accepted: 05-02-2023

Corresponding author: Dr. Sanjay Namadar

Conflict of interest: Nil.

Abstract:

Offloading is a crucial therapeutic approach that is vital for both avoiding and curing diabetic foot ulcers. There are many distinct unloading modalities, each with advantages and disadvantages of its own. Which method is the best that can be easily applied and that can aid in ulcer healing is crucial in clinical practice. The primary cause of neuropathic diabetic foot wounds is pressure combined with cycles of recurrent stress, which compromises the integrity of the skin and soft tissues. The proper debridement of nonviable tissue and sufficient pressure relief form the basis of any therapeutic strategy for neuropathic diabetic foot ulcers (off-loading).

Keywords: Mandakini Offloading, Diabetic Foot, Plantar Ulcers.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

We are all aware that increased plantar foot pressure in diabetics is a major contributor to ulceration. A sufficient blood supply, infection management, proper wound care, and "offloading" or pressure redistribution of the ulcerative

area are all necessary for these ulcers to heal [1,2]. Out of all these variables, "offloading" presents a special problem in the management of chronic wounds. Podiatrists have employed a variety of strategies to offload these wounds as

diabetic foot care has developed over time, including total bed rest, cut-out felt pads, crutches, wheelchairs, zimmer frames, temporary shoes, ortho wedge shoes like rocker-bottom wedge design shoes, and total contact casting [3,4,5]. A patient with diabetes mellitus (DM) spends roughly 10% of their annual income, a patient with diabetes foot ulcers (DFU) spends 30% of their annual income, and a patient with diabetic foot lesions (DFI) spends > 50% of their annual income. Approximately 80% of diabetic feet have some degree of neuropathy. 15% of them experience DFU at some point in their lives. 50% of these DFU become ill, 50% are hospitalised, and 50% of these individuals require amputations [6].

DFU is essentially a patho-physiologic issue with the biomechanics of the foot. Due to altered biomechanics brought on by pan neuropathy in diabetes, an insensitive foot does not recognise the pressure at planter level and eventually develops a diabetic planter ulcer. In diabetes, plantar ulcers are the most prevalent neuropathic lesions. The plantar region is where 80% of diabetes ulcers occur. Common sites for these ulcers include the first MCP joint, the great toe's ball, the fifth MCP joint, and the heel. Instead of being caused by medical anomalies, these ulcers are the result of incorrect foot biomechanics. Antimicrobial creams or treatments are ineffective at curing these sores. [7].

This study aimed to evaluate the effectiveness of the Mandakini offloading device in the treatment of diabetic foot plantar ulcers in terms of ideal off-loading features, duration of ulcer healing, and ulcer recurrence, comparing the rates of amputation, infection, recurrence, and Mandakini off-loading device versus traditional gauze dressing in terms of how long an ulcer takes to heal.

Method

At LSK Hospital, Kishanganj, a prospective comparison study design was carried out between May 2020 and December 2021. For this study, a total of 80 patients with plantar ulcers on their diabetic feet were recruited. These 80 patients were divided into two groups: 40 were kept on Mandakini off-loading dressing and 40 were kept on the conventional dressing. These 80 patients were monitored until the diabetic foot ulcers had fully healed. The length of hospital stay was used to calculate this follow-up.

The MS-Excel database was fed with the information gathered from the patient with plantar ulcers on their diabetic feet who was admitted to the general surgery ward. Mean± Standard Deviation was used to show the data for the quantitative variables, while frequency along with their corresponding percentages was provided for the qualitative/categorical variables. For two groups, a Student-t test and a Wilcoxon signed rank test were used to compare the data. A p value of less than 0.04 was deemed statistically significant.

Results

Most of the patients were between the ages of 40 and 70. With a mean SD of (54.96±9.83) for the Mandakini dressing and (51.4±9.15) for the conventional dressing, the age distribution is statistically comparable between the two groups (p=0.150). In Mandakini offloading, the gender ratio for men and women is 63.2% to 36.6%, while for men and women wearing conventional dressing, it is 66.6% to 33.2%.

66.6% of patients who had mandakini off-loading and 33.2% of patients who received traditional dressing have forefoot ulcers and 39% have rear foot ulcers, respectively. The statistical difference in the ulcer's site between the two groups is (p=0.591).

Table 1

Parameter			Group		
			Conventional Dressing	Mandakini Off-Loading	Total
Site of Ulcer	Forefoot ulcer	Count	31	29	38
		Percentage within Group	60.01%	66.71%	63.31%
	Hind Foot Ulcer	Count	9	11	20
		Percentage within Group	40.01%	33.31%	36.71%
Total		Count	40	40	80
		Percentage within Group	100%	100%	100%

Five patients (21%) of the patients who had undergone Mandakini off-loading procedures needed additional disarticulations or amputations to manage their illness. As opposed to the usual dressing, which needed future disarticulations or amputations in 7 patients (26.5%) ($p = 811$).

The majority of the patients (66.6% with traditional dressing and 60% with Mandakini offloading) had grade 1 ulcers ($p=0.591$). 11 patients (33.2%) of those who underwent offloading experienced pain on the scale of 3, compared to a standard dressing maximum of 9 patients (33.2%) with pain on the scale of 7.

Discussion

80 diabetic patients with plantar foot ulcers were randomly allocated into two groups: 40 underwent Mandakini off-loading, and 40 underwent traditional dressing in this prospective comparative study.

1. Patients in the current study who had Mandakini off-loading had considerably lower pain scores. Compared to standard dressing, which can only be worn by 9 patients (33.2%), 11 patients (33.2%) reported pain on a scale of 1 to 10. Results with ($p = 0.002$) indicating statistical significance According to Sunil V. Kari [7], who used the "mandakini off-loading device" to treat diabetic foot plantar ulcers, patients in the off-loaded group reported significantly

less discomfort and were more compliant than those in the non-off-loaded group.[8]

2. The average hospital stay for study participants who had Mandakini off-loading was 22.032 days, compared to 25.932 days for the standard dressing group. Statistically significant outcome with a p-value of 0.003. According to a study by Gayle E. Reiber et al. [6], the average hospital stay for diabetic individuals with foot ulcers was about 20.6 days.
3. Individuals in the current study who received mandakini offloading dressing had a mean dressing score of 4.732 as opposed to 17.932 for patients who received traditional dressing. The findings were significant ($p = 0.002$) In his investigation, Sunil v Kari [7] came to the conclusion that much less bandages were utilised to treat diabetic plantar ulcers.

Conclusion

Patients who underwent offloading technique had much less discomfort, a shorter hospital stay, fewer bandages, better compliance, and a lower financial burden on themselves, according to studies utilizing a straightforward offloading device. Therefore, the Mandakini off-loading technique is recommended in our study for treating plantar ulcers in diabetic patients because it is more palatable, more compliant, and results in a shorter hospital stay and a lower financial burden for the patients.

References

1. Brand PW. The diabetic foot in diabetes mellitus—Theory and Practice, 3rd edn. Ellenberg M. Rifkin H.
2. Frykberg RG, Bailey LF, Matz A, Panthel LA, Ruesch G. Offloading properties of a rocker insole: A preliminary study. *Journal of the American Podiatric Medical Association*. 2002 Jan 1;92(1):48-53.
3. American Diabetes Association. Consensus Development Conference on Diabetic Foot Wound Care: 7-8 April 1999, Boston, Massachusetts. American Diabetes Association. *Diabetes care*. 1999 Aug 1;22(8):1354-60.
4. Pinzur MS, Dart HC. Pedorthic management of the diabetic foot. *Foot and ankle clinics*. 2001 Jun 1;6(2):205-14.
5. Armstrong DG, Liswood PJ, Todd WF. Potential risks of accommodative padding in the treatment of neuropathic ulcerations. *Ostomy/wound management*. 1995 Aug 1;41(7):44-6.
6. Reiber GE, Lemaster JW. Epidemiology and economic impact of foot ulcers and amputations in people. Levin O'Neal's Diab Foot CD-ROM. 2007 Oct 9; 13:3.
7. Kari SV. The economical way to off-load diabetic foot ulcers [Mandakini off-loading device]. *Indian Journal of Surgery*. 2010 Apr;72(2):133-4.
8. Pyar K. P., Hla S. A., Lwin K. T. Y., Aung Z. N. H., Myat K., Maung L. M., Hein Y. M., Aung L. H., Thant M. M., Maung M. M., Zaw M. H., Mg Y. H., Maung N. L., Win T., Mg K. T., Phone S. S., Ya K. Z., Kyaw A. P., Aung Z. P., Kyaw M. T., Min S., Moe T. A., Oo K. M., & Ko M. K. Clinical and laboratory predictors for acquiring COVID-19 infections in patients on maintenance hemodialysis in 5th wave of epidemic in Myanmar. *Journal of Medical Research and Health Sciences*, 2022; 5(12): 2345–2354.