

# A STUDY ON KNOWLEDGE AND PRACTICE OF FOOT CARE IN PATIENTS WITH DIABETES MELLITUS

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**ABSTRACT :** Type 1 Diabetes Mellitus is a metabolic disease where the insulin producing  $\beta$ -cells in the pancreatic islets of Langerhans are progressively destroyed. When the insulin production is no longer sufficient to keep the appropriate blood glucose concentration, hyper glycaemia with subsequent glycosuria occurs. The main aim of the study is to analyse the knowledge and practice of foot care in patients with DM. This is a prospective cross sectional study performed between December 2017 to March 2018 on an in-patient population at Hyderabad. A cross sectional study performed on patients who were admitted to HSNZ from the 1st September 2013 to 30th April 2014 for diabetic foot infections. They were interviewed with a questionnaire of 15 'yes' or 'no' questions on foot care knowledge and practice. Score of 1 was given for each 'yes' answer. The level of knowledge and practice, whether good or poor, was determined based on the median score of each category. The result was tested using a chi-square test in SPSS version 17. A total of 57 patients were included in this study with a mean age of 56.33 years (31-77). There were 72 male (45.9%) and 85 female (54.1%) patients with the majority of them being Malays (154 patients, 98.1%). Majority of the patients (58%) had poor foot care knowledge while 97 patients (61.8%) had poor diabetic foot care practice as compared to the median score. Based on the chi square test of relatedness, there was no significant association between knowledge and practice with any of the variables. In conclusion, the majority of patients admitted for diabetic foot infections had poor knowledge and practice of diabetic foot care. Education regarding foot care strategies should be emphasized and empowered within the diabetic population.

**KEY WORDS:** Knowledge and practice, diabetic foot care, in-patient, tertiary care center

## I. INTRODUCTION

A **diabetic foot** is a foot that exhibits any pathology that results directly from diabetes mellitus or any long-term (or "chronic") complication of diabetes mellitus.<sup>[1]</sup> Presence of several characteristic diabetic foot pathologies such as infection, diabetic foot ulcer and neuropathic osteoarthropathy is called **diabetic foot syndrome**.

Due to the peripheral nerve dysfunction associated with diabetes (diabetic neuropathy), patients have a reduced ability to feel pain. This means that minor injuries may remain undiscovered for a long while. People with diabetes are also at risk of developing a diabetic foot ulcer. Research estimates that the lifetime incidence of foot ulcers within the diabetic community is around 15% and may become as high as 25%.<sup>[2]</sup>

In diabetes, peripheral nerve dysfunction can be combined with peripheral artery disease (PAD) causing poor blood circulation to the extremities (diabetic angiopathy). Around half of patients with a diabetic foot ulcer have co-existing PAD.<sup>[3]</sup>

Where wounds take a long time to heal, infection may set in and lower limb amputation may be necessary. Foot infection is the most common cause of non-traumatic amputation in people with diabetes.<sup>[4]</sup>

Prevention of diabetic foot may include optimising metabolic control (regulating glucose levels); identification and screening of people at high risk for diabetic foot ulceration; and patient education in order to promote foot self-examination and foot care knowledge. Patients would be taught routinely to inspect their feet for hyperkeratosis, fungal infection, skin lesions and foot deformities. Control of footwear is also important as repeated trauma from tight shoes can be a triggering factor.<sup>[5]</sup> There is however only limited evidence that patient education has a long-term impact as a preventative measure.<sup>[6]</sup> "Of all methods proposed to prevent diabetic foot ulcers, only foot temperature-guided avoidance therapy was found beneficial in RCTs" according to a meta-

analysis.<sup>[7]</sup>

Treatment of diabetic foot can be challenging and prolonged; it may include orthopaedic appliances, antimicrobial drugs and topical dressings.<sup>[6]</sup>

Most diabetic foot infections (DFIs) require treatment with systemic antibiotics. The choice of the initial antibiotic treatment depends on several factors such as the severity of the infection, whether the patient has received another antibiotic treatment for it, and whether the infection has been caused by a micro-organism that is known to be resistant to usual antibiotics (e.g. MRSA). The objective of antibiotic therapy is to stop the infection and ensure it does not spread.

It is unclear whether any particular antibiotic is better than any other for curing infection or avoiding amputation. One trial suggested that ertapenem with or without vancomycin is more effective than tigecycline for resolving DFIs. It is also generally unclear whether different antibiotics are associated with more or fewer adverse effects.<sup>[4]</sup>

It is recommended however that the antibiotics used for treatment of diabetic foot ulcers should be used after deep tissue culture of the wound. Tissue culture and not pus swab culture should be done. Antibiotics should be used at correct doses in order to prevent the emergence of drug resistance.

The main aim of the study is to analyse the knowledge and practice of foot care in patients with DM. The main objective of this study is to determine the level of knowledge and practice of foot care in diabetics who require admission for diabetic foot complications. And also want to determine the factors associated with the different levels of knowledge and practice of foot care.

## II. MATERIALS AND METHODS

**STUDY TYPE:** Observational.

**STUDY SITE:** Study is conducted at OM SAI HOSPITALS (BALAPUR)

**SAMPLE SIZE:** 57 Subjects

**STUDY DURATION:** study will be of 8 months. From Dec 2017 to March 2018.

This is a prospective cross sectional study performed between December 2017 to March 2018 on an in-patient population at Hyderabad. A non-randomized convenient sampling method was performed and an informed consent was obtained from the participants. The inclusion criteria was diabetic patients who required admission due to diabetic foot complications such as infected diabetic foot ulcers, cellulitis of the foot, foot abscesses, septic arthritis of the ankle joint, wet gangrene and necrotizing fasciitis of the foot. We excluded patients who were admitted for infection of the lower limb from the level of the calf cephalically such as intra-muscular abscess of the calf, septic arthritis of the knee, thigh abscess and infected transtibial or transfemoral amputation stump. Patients with poor conscious level and clinically delirious or demented were also excluded.

Patients' demographic data were collected for the purpose of analyzing the factors that were associated with knowledge and practice of diabetic foot care. Information such as age, gender, race and the duration since diagnosed with diabetes mellitus were collected together with educational level and household income per month; a local currency. Data regarding duration since diagnosed with diabetes, educational level and household income per month were then divided into two different groups, each. Duration since diagnosed with diabetes was grouped into more and less than 10 years.

We used a diabetic foot care questionnaire designed by Hasnain et al, <sup>2</sup> which is a set of 15 'yes', or 'no' questions on knowledge and practice. The questionnaire was translated into local language and was tested and validated. Medical personnel interviewed all patients during the completion of the questionnaire. It covered good foot care practice in the areas of feet washing techniques, skin and nail care and foot wear care. Each 'yes' answer carried one (1) point and zero point for a 'no'. The points were then added up for each of the knowledge and practice categories. The level of knowledge and practice, whether good or poor, was determined based on the median score of each category. Those who scored more than the median were considered as good and scores lower than the median were considered as poor. The association between duration since diagnosed with diabetes and other socio demographic factors with the level of knowledge and practice of foot care were tested using a chi-

square test in SPSS version 17. All data generated and collected were tabulated using a normal frequency table.

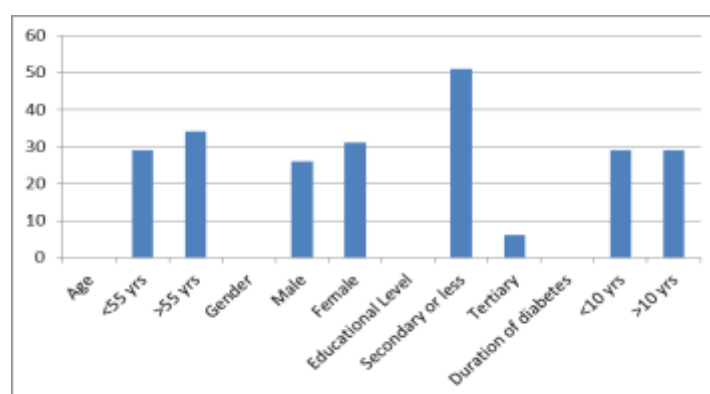
### III.RESULTS AND DISCUSSION

A total of 57 patients were included in this study with a mean age of 56.33 years (range 31-77) with 34 patients (59.9%) 55 years or older. There were 26 male (45.9%) and 31female (54.1%) patients with the majority of them were adults. Only three patients were children (1.9%) from the whole study sample. The mean duration since diagnosed with diabetes was 11.26 years (1-38). Most patients had diabetes for less or equal to 10 years (53.5%). A large majority of the patients earned less than RM 2000,00 monthly (44 patients, 76.4%) and only 5 (8.9%) patients had received education beyond the SPM at tertiary level.

**Table 1: Sociodemographics of diabetic populations Variable admitted for diabetic foot complication**

Variable	N(%)
Age	
<55 yrs	29(40.1)
>55 yrs	34(59.9)
Gender	
Male	26(45.6)
Female	31(54.2)
Educational Level	
Secondary or less	51(88.9)
Tertiary	6(11.1)
Duration of diabetes	
<10 yrs	29(50.5)
>10 yrs	29(50.5)

**Graph 1: Sociodemographics of diabetic populations Variable admitted for diabetic foot complication**

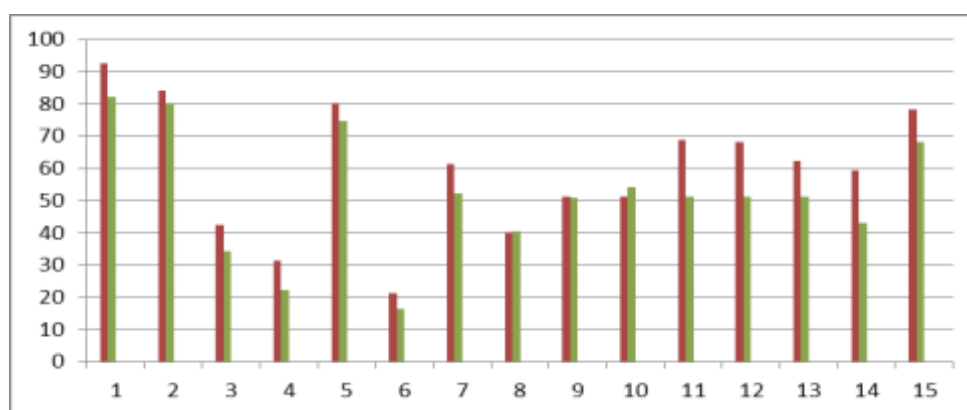


The responses for each foot care measure were generally good except for some in areas of feet washing technique and skin care of the feet. Application of talcum powder in the inter digital space has the lowest positive response with 23.6 percent for knowledge and 15.9 percent for practice. The other foot care measures that received poor responses were: the use of warm water for washing or bathing (47.8% for knowledge, 34.4% for practice); checking the temperature of water before using (31.2% for knowledge, 22.3% for practice) and not to apply lotion in the interdigital space (42.0% for knowledge and 42% for practice). Patients relatively gave satisfactory response to daily change of socks with 52.9 percent for knowledge, however its practice was only 40.8 percent, which was considered poor.

**Table 2: Analysis of factors associated with the levels of knowledge and practice**

Variables	Poor	Good	P value	Poor	Good	P value
<b>Gender</b>						
Male	38(66.7)	19(33.3)	0.631	33(58.3)	24(41.7)	0.324
Female	33(57.6)	24(42.4)		33(57.6)	24(42.4)	
<b>Age</b>						
<55 yrs	33(58.7)	24(41.3)	0.751	39(67.7)	19(33.3)	0.123
>55 yrs	32(57.4)	24(42.6)		33(58.2)	24(41.5)	
<b>Income</b>						
<RM 2000	32(57.5)	24(42.5)	0.563	34(60.0)	23(40.0)	0.621
>RM 2000	31(50.0)	29(50.0)		35(61.5)	22(38.5)	
<b>Educational level</b>						
Secondary	32(57.6)	24(42.4)	0.231	35(60.8)	23(39.5)	0.723
Tertiary	24(42.9)	32(57.1)		36(57.1)	24(42.9)	
<b>Duration of diabetes</b>						
<10 yrs	22(39.3)	35(60.7)	0.321	36(63.1)	21(36.9)	0.617
>10 yrs	30(51.5)	28(48.5)		23(40.9)	23(40.9)	

**Graph 2: Analysis of factors associated with the levels of knowledge and practice**



The majority of patients who were admitted for diabetic foot complications had poor foot care knowledge, with 58 percent of them scoring less than the median score of 10. In terms of practice, the number of patients with poor practice was also greater with 97 patients (61.8%) scored less than median score of nine. Based on the chi square test of relatedness age, gender, household income per month, educational level and duration since diagnosed with diabetes had no significant association with knowledge and practice with none of the variables had p value of less than 0.05.

**TABLE 3: Diabetic foot care questionnaire assessing knowledge and practice. The values are showing positive responses**

	Foot care measures	knowledge	practice
1	Importance of taking anti diabetic treatment to prevent complication	53(92.6)	47(82.3)
2	Daily washing of the feet	48(84.2)	46(80.2)
3	Using warm water for washing bathing	24(42.3)	19(34.2)
4	Checking the temperature of the water before using	18(31.2)	13(22.3)
5	Drying the feet after washing	29(80.3)	42(74.5)
6	Talcum powder usage for keeping interdigital space dry	12(21.3)	9(16.3)
7	Keeping the skin of feet soft to prevent dryness	35(61.3)	30(52.3)
8	Lotion not to be applied in the interdigital space	23(40.2)	23(40.6)
9	Daily change of socks	29(51.3)	20(51)
10	Trimming toe nails straight with care	29(51.3)	31(54.1)

11	Inspection of feet daily by respondents	39(68.9)	29(51.3)
12	Wearing comfortable coat shoes	39(68.3)	29(51.3)
13	Checking the inside of the shoes before wearing	36(62.3)	29(51.3)
14	Not walking barefoot	34(59.3)	25(43.2)
15	Wearing signs of which consultation is required	45(78.3)	39(68.3)

### CONCLUSION

In conclusion, the present study highlights the importance of thiazole-thiadiazole derivatives for rational drug designing for various diseases. And therefore serves as lead molecules for further modification (molecular modeling) to obtain clinically useful entities. On the basis of predicted biological activity spectra, new lead structures were discovered with antimicrobial, antifungal, antiviral and anti-diabetic, anti-inflammatory activities etc.,

### REFERENCES

1. Hasnain S, Sheikh NH. Knowledge and practices regarding foot care in diabetic patients visiting diabetic clinic in Jinnah Hospital, Lahore. *J Pak Med Assoc.* 2009;59(10):687–690
2. Singh, N. "Preventing Foot Ulcers in Patients With Diabetes". *JAMA*. Retrieved 21 November 2013.
3. International Working Group on the Diabetic Foot (2015). "Guidance on the diagnosis, prognosis and management of peripheral artery disease in patients with foot ulcers in diabetes". Retrieved 23 November 2015.
4. Selva Olid A, Solà I, Barajas-Nava LA, Gianneo OD, Bonfill Cosp X, Lipsky BA (4 September 2015). "Systemic antibiotics for treating diabetic foot infections". *Cochrane Database of Systematic Reviews* (9):
5. Stiegler, H (2004). "Das diabetische Fußsyndrom". *Herz.* **29** (1): 104–15.
6. Dorresteijn JAN, Kriegsman DMW, Assendelft WJJ, Valk GD (2014). "Patient education for preventing diabetic foot ulceration". *Cochrane Database of Systematic Reviews* (12).
7. Arad Y, Fonseca V, Peters A, Vinik A (2011). "Beyond the Monofilament for the Insensate Diabetic Foot: A systematic review of randomized trials to prevent the occurrence of plantar foot ulcers in patients with diabetes". *Diabetes Care.*
8. Hasnain S, Sheikh NH. Knowledge and practices regarding foot care in diabetic patients visiting diabetic clinic in Jinnah Hospital, Lahore. *J Pak Med Assoc.* 2009;59(10):687–690.
9. Desalus OO, Salawu FK, Jimoh AK, Adekoya AO, Busari OA, Olokoba AB. Diabetic foot care: Self reported knowledge and practice among patients attending three tertiary hospitals in Nigeria. *Ghana Med J.* 2011;45(2):60–65.
10. Bazian Ltd. Education to prevent foot ulcers in diabetes. *Evidence-Based Healthcare and Public Health.* 2005;9:351–358.
11. Ang CL, Lim YJ. Recurrent Admissions for Diabetic Foot Complications. *Mal Orthop J.* 2013;7:21–26.