

Original Article

Frequency of patients with diabetes taking proper foot care according to international guidelines and its impact on their foot health

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Abstract

Objective: To determine the frequency of people with diabetes, practicing proper foot care according to International Guidelines and its impact on their foot health.

Methods: This cross sectional study was conducted on 100 people with diabetes in General Medicine Out Patients Department of Pakistan Institute of Medical Sciences, Islamabad from January to May 2007. Patients were enquired about their foot care practices. Patients following more than 70% of American Diabetes Association (ADA) guidelines for foot care were labeled as practicing "Proper foot care". Foot examination of included patients was also performed and foot care practices were compared with examination findings.

Results: Mean age of included patients was 51.57±10.72 years. Only six (6%) patients were found to be practicing proper foot care. There were statistically significant correlations between proper foot hygiene and frequent foot washing, fungal foot infections and foot drying practices, and ingrowing toe nails and improper nail trimming. Corns and callosities and ingrowing toe nails were associated with inappropriate foot wear. It was also found that proper foot care practice was related with foot care education.

Conclusions: This study demonstrated that very few patients with diabetes were practicing proper foot care according to the ADA Guidelines. High risk behaviours were common which could lead to preventable foot complications (JPMA 60:732; 2010).

Introduction

The importance of foot care cannot be denied in diabetic patients. The life time prevalence of foot ulceration in patients with diabetes is about 15% and the most frequent component causes for lower-extremity ulcers are trauma, neuropathy, and deformity, which are present in majority of patients.¹

The patient plays a crucial role in the prevention of diabetic foot disease and therefore education regarding foot care is important.² Patients are more likely to comply with a treatment regimen when they have sufficient knowledge about their medical condition. Foot care knowledge and behaviour of patients seems positively influenced by patient

education in the short term.³⁻⁵

In Pakistan, majority of patients with diabetes do not pay proper attention to their feet. An important reason of this attitude is that patients are not provided with foot care education and therefore remain unaware of the adverse consequences of neglect.⁶ Improper foot care leads to many complications that may result in ulcerations and eventually amputations. Corns and calluses can be caused by mechanical stresses from poorly fitted shoes.⁷ Similarly the practice of keeping the foot wet predisposes to fungal infections which may lead to cellulitis.⁸

To assess the actual magnitude of the problem, it is important to document foot care behaviour. This

study was designed to assess various aspects of foot care practices in patients with diabetes and evaluate the effects of these practices on the clinical conditions of the feet. The impact of social and cultural aspects on foot care was also explored. Data of this study may be helpful in modifying guidelines for diabetic foot care according to our socioeconomic and cultural background.

Patients and Methods

This cross sectional study was conducted in General Medicine Out Patients Department of Pakistan Institute of Medical Sciences, Islamabad. Data was collected between January and May 2007. Inclusion criteria consisted of adult patients who had diabetes (type I or type II) for at least 3 years, were capable of self care and were physically independent. Exclusion criteria comprised patients with active foot ulcers, Charcot foot, congenital foot deformities, foot amputation and visual impairment.

The number of patients fulfilling the inclusion criteria was estimated to be 15 per week. Anticipated frequency of "proper foot care" was 11%. At 95% confidence interval sample size was estimated to be 92, using 11% identified factor. Sample size was inflated to 100 for additional contingencies. Non probability convenience sampling was used. Hospital Ethical Committee' approval was taken. Informed verbal consent was taken from patients and data was collected using a questionnaire developed for this study. Questionnaire was pilot tested to clarify understanding of questions. The questions were derived from ADA Guidelines for Diabetes foot care.^{9,10} Fourteen questions were included (Table-1) and patients following 9 or more than 9 guidelines (more than 70%) were labeled as practicing "proper foot care," after consulting diabetologists. Information about literacy status, monthly income, duration of diabetes, previous history of foot infections, previous hospitalizations due to foot infection and provision of foot care education was also collected.

A foot examination check list was also developed which scored on the presence or absence of proper foot hygiene, skin texture, corns and callosities, deformities in the form of hallux valgus, hammer toe or claw toe, ingrowing toe nails and fungal infections.

Data was collected by principal investigators for consistency. For ethical purposes foot care education was also promoted among unaware diabetic patients who participated in the study.

Data was analyzed using SPSS version 10.0. Mean with standard deviation was calculated for age. Frequencies

and percentages were estimated for various foot care practices and examination findings. The chi-square test was used to associate the following variables; foot care practices, results of foot examinations, proper foot care according to the criteria along with social background and the course of diabetes.

Results

In the study 45 (45%) patients were males and 55 (55%) were females. The mean age was 51.57 ± 10.72 years. Only 6 (6%) patients were practicing proper foot care, (4 males and 2 females). The frequencies and percentages of various foot care practices are shown in Table-1.

Table-1: Distribution of Foot Care Practices (n=100).

Foot care practices	Frequencies (percentages)
1. Patients who inspected feet daily	17 (17%)
2. Patients who washed feet once daily	20 (20%)
3. Patients who washed feet multiple times a day	73 (73%)
4. Patients who dried their feet properly after every foot wash	23 (23%)
5. Patients who applied emollients to their feet	27 (27%)
6. Patients who checked shoes before wearing them	25 (25%)
7. Patients who wore cotton socks	8 (8%)
8. Patients who walked bare feet	36 (36%)
9. Patients who trimmed their nails properly (straight, leaving the edges)	19 (19%)
10. Patients who wore correct fitting, low heel leather shoes	24 (24%)
11. Patients who self treated their foot for problems like corns, callosities and trauma	21 (21%)
12. Patients who sat near heater/fire	16 (16%)
13. Patients who ever had foot examination by a doctor	40 (40%)
14. Patients compliant with anti diabetic treatment	63 (63%)
15. Patients who smoked cigarettes	31 (31%)

Foot examination revealed that 32 (32%) patients had inappropriate foot hygiene and 50 (50%) patients had dry skin. Corns and callosities were found in 40 (40%) patients and cracks and fissures were observed in 48 (48%) patients. In growing toe nails were present in 35 (35%) patients. Fungal infection (Taenia pedis and Onychomycosis) were found in 43 (43%) and foot deformities in 21 (21%) patients.

None of the patients had had regular foot examination by doctors, 60 (60%) patients never had their foot examined by any doctor and 40 (40%) patients were once examined many years ago.

The associations of foot care practices and examination findings are shown in Table-2. Table-3 demonstrates the relationship of proper foot care as an outcome variable, with various social factors.

Table-2: Associations of foot care practices with foot examination (n=100).

Foot care practices		Foot examination findings			
		Fungal infections			
		Yes	No	P value	Chi-Square value
Foot washing more than once daily	Yes	31	42	0.85	0.031
	No	12	15		
		Fungal infections			
Drying of feet after every foot wash	Yes	3	20	0.001	10.936
	No	40	37		
		Healthy skin texture			
Emollient application after foot wash	Yes	20	7	0.003	8.547
	No	30	43		
		Corns and callosities			
Proper foot wear	Yes	4	20	0.007	7.164
	No	36	40		
		In growing toe nails			
Proper foot wear	Yes	3	21	0.008	7.027
	No	32	44		
		Foot deformities			
Proper foot wear	Yes	2	22	0.358	3.228
	No	19	57		

Table-3: Associations of Proper Foot Care practice (n=100).

Independent variables	Proper foot care			P value
	Yes	No		
Literacy status (primary and onwards)	Yes	5	62	0.380
	No	1	32	
Monthly income more than 10,000 Rupees	Yes	3	23	0.167
	No	3	71	
Diabetes duration of more than 10 years	Yes	2	24	0.673
	No	4	70	
History of foot infections	Yes	3	31	0.39
	No	3	63	
Foot education provided	Yes	6	32	0.001
	No	0	62	

Discussion

The frequency of diabetic patients taking proper foot care was suboptimal in this study and revealed variations in the behaviour of patients. It was evident from the study that most of the patients were not following ADA Guidelines and religious, social and cultural values had an influence on that. Majority of patients were washing their feet multiple times a day but were not drying them. An important reason for this practice was performing Wudhu (abulution) five times a day. Certain studies acknowledged the importance of Wudhu in foot care¹¹ though few others concluded increased prevalence of athlete's foot in Muslims due to washing their feet multiple times a day for attending the mosque.¹² However this study showed that increased frequency of foot washing had an impact on foot hygiene but was not associated with fungal infections. Keeping the foot wet is quite a common practice in our society especially among housewives. Only 23% of the patients were careful

about drying their feet and even in this minority, drying of web spaces was a rarely performed practice.

Many studies have been conducted world wide showing poor foot care knowledge and practices among patients with diabetes. A study of 100 patients with diabetes, in three tertiary care hospitals of Rawalpindi showed that only 34 % patients inspected their feet daily and 52% did not know about correct technique of nail cutting.¹³ Another study done in Iran showed that 60% patients with diabetes failed to inspect their feet, 42% did not know how to trim their toe nails and 62% used to walk bare feet.¹⁴ In the present study, the results were even more alarming and percentages of high risk behaviours were worrisome.

So far no study has assessed foot wears in primary prevention of ulcers. However in recent years the diabetic community has accepted that good foot wear, prevent ulceration.¹⁵ The relation of inappropriate foot wear with ingrowing toe nails, corns and callosities has been established in many studies and it was evident from the present study as well. Selection of appropriate foot wear is important and requires patient's education. Usually patient's priorities about foot wear selection are dependent on social, cultural and climatic conditions.¹⁶ Many diabetic patients do not wear socks and closed shoes in summer as that aggravates their neuropathic symptoms. A study done in UK showed that though therapeutic foot wear were provided free of cost, only 22 patients regularly used them.¹⁷ Similar problems have been reported in the US.¹⁸

This study emphasizes the need of provision of foot care education. It showed that only 38% patients with diabetes were taught about foot care methods. They

remained ignorant about the importance and methods of foot care even after hospitalization for foot infections. Out of 16% patients who were admitted due to foot infection, only 8% received foot care education in hospital. The association of foot care education with better foot care practices has been emphasized earlier. De Bernard demonstrated that patients who received foot care education and had foot examination by doctors were significantly more likely to check their feet regularly.¹⁹ In another study multiple educational approaches were used to teach diabetic patients about foot examination, foot washing and proper foot wear. It was found that an intensive education programme improved the foot care knowledge and behaviour of high risk patients.²⁰ However few other studies showed contradictory results.²¹ Although socioeconomic and literacy status play an important role in proper foot care practice, our study failed to establish any correlation between them which indicates that we need modifications at all levels.

This study suggests that ADA Guidelines should be revised and implemented according to our social and cultural requirements, to make them acceptable to diabetic patients. Patient's counseling regarding foot care is extremely important and should be emphasized on each visit.

Conclusion

The frequency of diabetic patients, taking proper care is highly inadequate. It is therefore the responsibility of the stake holders to design and implement diabetes education programmes with special emphasis on foot care education.

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