

EVALUATION OF KNOWLEDGE AND PRACTICES OF FOOT CARE IN PATIENTS WITH CHRONIC TYPE 2 DIABETES MELLITUS

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ABSTRACT

Objective: To evaluate the knowledge and practices of foot care in patients with diabetes mellitus and to stress upon the importance of such knowledge and practices in decreasing morbidity associated with diabetic foot disease.

Material and Methods: One hundred patients of either sex from three tertiary care hospitals with a 5 year history of Diabetes Mellitus were selected in this study and were asked to fill out a questionnaire about their knowledge and practices about daily foot inspection, foot cleaning, appropriate nail care, and use of footwear in the form of shoe material, open or closed forepart and nature of heel.

Results: Out of 100 patients (36 males and 64 females), 34% patients inspected their feet daily and 78% of the respondents knew about care of callosities, minor injuries and cuts, 52% of patients didn't know about correct technique of cutting nails. Eight (22.2%) male and 28 (43.8%) female patients were using open shoes while 24 (66.7%) male and 38 (59.4%) female patients had shoes with narrow forepart. Ten (27.8%) males were using shoes made of hard material as compared to 20 (31.3%) of female patients. Twenty two (34.4%) of our female diabetic patients were using shoes with high heel. Only 68% of the patients were on regular follow up.

Conclusion: This simple quality initiative concludes the notion that patients with diabetes who are at risk for the development of diabetic foot ulcers should receive ongoing foot-specific patient education.

Keywords: Diabetes Mellitus, Diabetic foot disease, Foot care, Callosities.

INTRODUCTION

Diabetes mellitus is a growing health problem at all ages in all countries. Diabetic foot is one of the main complications of diabetes mellitus (DM) of high socio-economic impact, characterized by foot lesions resulting from neuropathy, ischemia and infection.¹⁻⁴ In addition to causing severe morbidities, they now account for the largest number of diabetes-related hospital bed days.⁵ In people with insensate extremities, such as those with diabetes mellitus, daily foot care and inspection can prevent the development of foot ulcers and the subsequent complications that may lead to amputation--one of the biggest threats to adults with diabetes.^{6,7} In patients with established diabetic foot infections careful attention and coordinated management, preferably by a multidisciplinary foot-care team can save many

feet from amputations.⁸⁻¹² Incidence rate of amputation in diabetics was 15 times higher than in non-diabetics.¹³

In patients with diabetes if blood glucose levels remain high, these foot problems can possibly lead to infection. Blisters develop when shoes keep rubbing the same spot on patient feet. Wearing shoes that do not fit properly or wearing shoes without socks may cause blisters. Blisters may become infected. Ingrown toe nails occur when the edges of the nail grow into the skin. The skin may get red and become infected. Ingrown nails usually result from trimming nail edges too much. Ingrown nails may also occur due to pressure from shoes. Bunions form when patient big toe angles in toward the second toe and the spot of toe bone increases its size. They may get red, cause pain and become infected. Narrow shoes

LIST OF POINTS INCLUDED IN THE QUESTIONNAIRE

Daily Examination of feet	No	Yes
Care of callosities, cuts and wounds	Poor	Adequate
Knowledge of nail cutting	Poor	Adequate
Shoe heel	High	Normal
Shoe Material	Hard	Soft
Forepart of shoes	Narrow	Adequate
Shoes Type	Open	Covered

Table 1

may produce bunions. Usually, bunions run in the family and may be eliminated with surgery. Plantar warts are caused by a virus and generally build up on the sole of the foot but tend to disappear without treatment. Too short shoes may also cause hammertoes. Dry and cracked skin occurs when the nerves in legs and feet do not get the message from brain to keep skin moist and soft. Dry skin may crack and germs producing infection enter. If blood glucose is high, germs increase in number and the infection does not heal. Athlete's foot is a fungus that causes redness, itching and cracking. Germs enter through the cracks in the skin of toes.⁵

All these foot problems may be solved. Preventive behaviors focus on not going barefoot, performing/receiving proper foot care, and wearing properly fitting shoes. Foot-specific patient education is an essential element of a health system diabetic foot program. Foot-specific patient education must be individualized, because of cognitive deficits in individuals with long-standing diabetes. Much diabetes-related pathology, especially among neuropathic patients, is potentially avoidable. Prevention, however, requires appropriate knowledge and understanding.¹⁴ To assess our ability to effect change in behavior we need to measure not only knowledge but also understanding and change of behavior⁹. We conducted a study using a structured questionnaire to be completed by the respondent, aiming to evaluate the knowledge and practices of foot care in patients with diabetes mellitus and to stress upon the importance of such knowledge and practices in decreasing morbidity associated with diabetic foot disease.

MATERIAL AND METHODS

This cross-sectional study about foot-care practices involved a convenience sample of 100 adult men and women with type 2 diabetes of at least 5 years duration and with no previous history of foot ulcers in the month of April to May 2007. Patients were recruited from three tertiary care hospitals of Rawalpindi including Fauji Foundation Hospital, Holy Family Hospital and Rawalpindi General Hospital who have been on treatment of

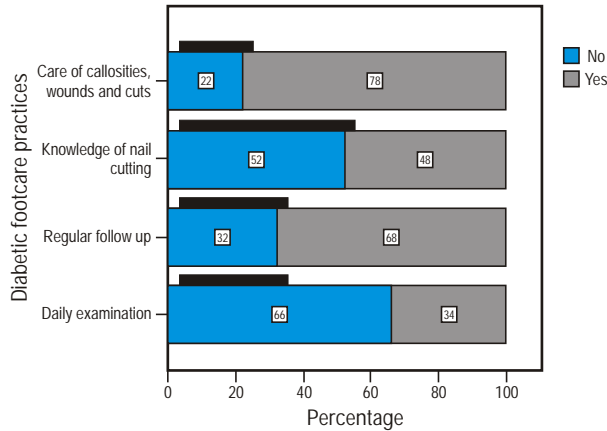
RESULTS OF VARIOUS PARAMETERS OF OUR STUDY AMONG MALE AND FEMALE PATIENTS

Parameters	Male	Female
Total Number	36	64
Age (yrs)	51.22 ± 6.76	47.88 ± 7.36
Duration of diabetes (yrs)	11.05 ± 3.99	10.78 ± 4.02
Type of treatment		
Insulin	18 (50%)	16 (25%)
Oral hypoglycemics	10 (27.8%)	36 (56.3%)
Insulin+oral hypoglycemics	8 (22.2%)	12 (18.7%)
Blood sugar control		
Poor	8 (22.2%)	22 (34.4%)
Adequate	20 (55.6%)	34 (53.1%)
Good	8 (22.2%)	8 (12.5%)
Knowledge of nail cutting		
Poor	18 (36%)	34 (53%)
Adequate	18(36%)	30 (47%)S
Daily examination of foot		
No	20 (55.6%)	46 (72%)
Yes	16 (44.4%)	18 (28%)
Type of heel used		
Flat	36 (100%)	42 (65.6%)
High	0 (0%)	22 (34.4%)
Shoe type		
Open	8 (22.2%)	28 (43.8%)
Covered	28 (77.8%)	36 (56.3%)
Forepart of shoe		
Narrow	24 (66.7%)	38 (59.4%)
Wide	12 (33.3%)	26 (40.6%)
Shoe material		
Hard	10 (27.8%)	20 (31.3%)
Soft	26 (72.2%)	44 (68.8%)
Care of callosities and cuts		
Poor	8 (22.2%)	14 (21.9%)
Adequate	28 (77.8%)	50 (78.1%)
Regular follow up		
No	12 (33.3%)	20 (31.3%)
Yes	24 (66.7%)	44 (68.8%)

Table 2

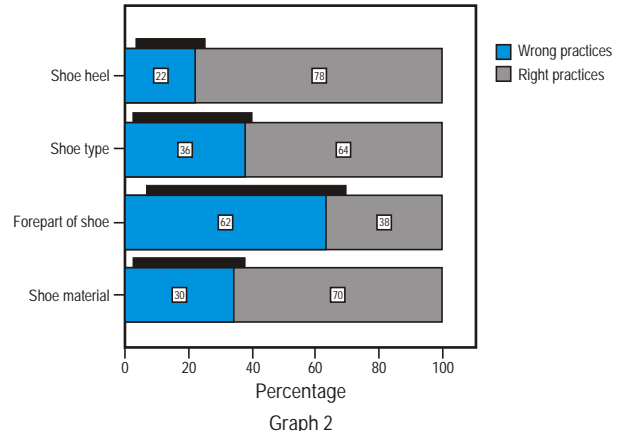
their diabetes for more than 5 years duration These patients were asked to fill in the questionnaire about their knowledge and practices about daily foot inspection, foot cleaning, appropriate nail care, and use of footwear in the form of shoe material open or closed forepart and nature of heel.(Questionnaires given in table 1). All patients included in the study are those who have been treated for their diabetes for a long time by various doctors ranging from primary care physicians or general practioners to consultant physicians. Patients who are health care professionals like doctors, nurses or paramedical

RESULTS OF DIABETIC FOOT CARE PRACTICES



Graph 1

RESULTS OF FOOTWEAR PRACTICES IN DIABETIC PATIENTS



Graph 2

staff and patients who had an episode of diabetic foot were excluded from study.

RESULTS

In a total of 100 patients with age ranged from 35- 65 years and a mean age of 49 years include 36% males and 64% females. Mean duration of diabetes was 10.8 3.88 years. 46% were using oral hypoglycemic agents, 34% were on insulin therapy and 20% were using a combination of insulin and oral hypoglycemic agents. 16% had tight control of their diabetes (HbA1c of <6.0), 54% were adequately controlled with their HbA1c between 6.0-7.7% and 30% were poorly controlled with HbA1c >7.7. Best control was seen among patients using a combination of insulin and oral hypoglycemic agents. 29.4%, 34.78% and 20% were poorly controlled on insulin alone, oral hypoglycemics alone and combined insulin and oral hypoglycemics group respectively. Regarding their foot care knowledge and practices, only 34% patients inspected their feet daily. Males are more concerned in it and 40 % of males are practicing it as compared to only 22 % of females. 78% of the respondents knew about care of callosities, minor injuries and cuts and the ratio was almost same in both males and females, 52% of patients didn't know about correct technique of cutting nails and this percentage was also same in both males and females (Graph 1). Most of the patients were wearing the wrong shoe type. 8 (22.2%) male and 28 (43.8%) female patients were using open shoes, 24 (66.7%) male and 38 (59.4%) female patients had shoes with narrow forepart. 10 (27.8%) males were using shoes made of hard material as compared to 20 (31.3%) female patients. Almost all male patients were using shoes with flat heel but 22 (34.4%) female diabetic patients were using shoes with high heel (Graph 2). 68% of the patients were in regular follow up

and were visiting the doctor at least once a month for last one year.

DISCUSSION

A substantial proportion of Type 2 diabetic patients are not offered adequate foot care, even in the presence of major risk factors for lower limb complications. Patient knowledge and practices are strongly related to physician attitudes. Our questionnaire was useful in assessing current foot care practices on a point-in-time basis. It revealed that most of our patients are ignorant about simple foot care practices like inspecting the feet daily. Knowledge about cutting nails was also poor. A study conducted at North Carolina School of Nursing revealed that those without foot ulcers have similar foot care practices to those with foot ulcers. Therefore the mere experience of going through the diabetic foot ulcer is not enough to bring a change in patient's behavior.¹⁵ To determine knowledge and practice of foot care in people with diabetes a questionnaire was completed by Diabetes Research Group, South Tees, UK, and a knowledge score was calculated and current practice determined. Deficiencies in knowledge included the inability to sense minor injury to the feet (47.3%), proneness to ulceration (52.4%) and effect of smoking on the circulation (44.5%). 24.6% (20.1-29.2) never visited a chiropodist, 18.5% (14.2-22.7) failed to inspect their feet and 83% (79.1-86.9) did not have their feet measured when they last purchased shoes. Practices that put patients at risk included use of direct forms of heat on the feet and walking barefoot. Barriers to practice of foot care were mainly due to co-morbidity. Those with high risk feet showed a higher (6.8) but not significant knowledge score compared to those at low risk (6.5) and their foot care practice was better.

Those individuals who have received foot

education or have had their feet examined by the doctor in out-patient or in-patient department are more likely to check their feet regularly. A study conducted in Italy¹⁶ revealed that more than 50% of the patients reported that they had not had their feet examined by their physician and 28% referred that they had not received foot education. Physicians tended to perform foot examination more often in males, low-income patients, those with foot complications, and those treated with insulin, but not in patients with the highest risk of foot complications, that is, those with diabetic neuropathy or peripheral vascular disease (PVD). GPs tended to perform foot examination less frequently than diabetologists do. Foot self-examination was not performed by 33% of the patients. It was found that in spite of ongoing patient education program; only approximately 80% were able to respond appropriately to simple questions related to the care of their "at-risk" feet. This reinforces that patients with diabetes who are at risk for the development of diabetic foot ulcers should receive ongoing foot-specific patient education. This information needs to be constantly reinforced, as retention drops with time.

In a survey of physician practice behaviors related to diabetes mellitus in the U.S about the physicians adherence to patients education regarding diabetic complications, it was found that adherence was high for eye exams, blood pressure measurements, neurological and circulatory exams, and laboratory procedures using blood. Adherence was low for examination of the teeth and gums, examination of the feet, and laboratory procedures involving the collection of urine. Internists generally had the highest adherence rates and consultants the lowest. Reported adherence decreased with physician age. Adherence was higher for the management of individuals with IDDM than for those with NIDDM.¹⁷ In another study in which multiple educational approaches were used to teach patients foot self-examination, foot washing, proper footwear, and encouragement in enlisting proper physician foot care, it was found that an intensive education program improved the foot care knowledge and behavior of high-risk patients. Those who adhered to a foot care education program were more satisfied with their foot care than prior to the program.¹⁸ The patient himself plays the crucial role in the prevention of diabetic foot disease and therefore education on foot care is important.¹⁹ The use of customized shoes reduced the development of new foot ulcers from 58 to 28 percent over one year of follow-up in a second report.²⁰ The feet should be washed daily in tepid water. Mild soap should be used and the feet should be dried by gentle patting. A moisturizing cream or lotion should then

be applied. A particularly effective strategy is to make specific recommendations to the patient in the form of a "contract" and to advise the patient to request that his or her feet be examined at every visit to the doctor or nurse.²¹

CONCLUSION

This simple quality initiative reinforces the notion that patients with diabetes who are at risk for the development of diabetic foot ulcers should receive ongoing foot-specific patient education. This information needs to be constantly reinforced, as retention drops with time. Preventive practices must be stressed and reinforced so those without foot ulcers should not develop ulcers. The results highlight areas where efforts to improve knowledge and practice may contribute to the prevention of foot ulcers and amputation. A diabetic nurse educator should be present in each diabetes outpatient clinic and in medical indoor departments and where feasible specialized podologist in foot care.

Recommendations

It is important that prophylactic advice on foot care be given to any patient whose feet are at high risk. There are a series of recommendations that can markedly diminish ulcer formation; they are particularly important in patients with existing neuropathy.

- Controlling blood sugar levels can reduce the blood vessel and nerve damage that often lead to diabetic foot complications. If a foot wound or ulcer does occur, blood sugar control reduces the risk of requiring amputation.
- Avoid smoking, walking barefoot, the use of heating pads or hot water bottles, and stepping into a bath without checking the temperature.
- The toenails should be trimmed to the shape of the toe and filed to remove sharp edges.
- The feet should be inspected daily, looking between and underneath the toes and at pressure areas for skin breaks, blisters, swelling, or redness. The patient may need to use a mirror or, if vision is impaired, have someone else perform the examination.
- The patient's shoes should be snug, not tight, and the socks should be cotton, loose fitting, and changed every day. Patients who have misshapen feet or have had a previous foot ulcer may benefit from the use of special customized shoes.
- In every medical out patient department and especially in diabetes clinics there should be specialized diabetes nurse educators who should teach the patients about care of feet and the measures to avoid ulcers and infections. There should also be posters, pamphlets and some video demonstrations

about proper techniques of foot care

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