DIABETIC FOOT RISK CLASSIFICATION IN A TERTIARY CARE TEACHING HOSPITAL OF PESHAWAR

Ghulam Shabbier, Said Amin, Ishaq Khattak, Sadeeq-ur-Rehman

Department of Medicine
Khyber Teaching Hospital Peshawar - Pakistan

ABSTRACT

Objective: *To find out diabetic foot risk classification in patients admitted with diabetes mellitus at a tertiary care teaching hospital.*

Material and Methods: *The hospital record of one hundred and twenty seven patients of diabetes mellitus, admitted to the medicine department, Khyber teaching hospital Peshawar from 1st October 2005 to 31st March 2006 were evaluated against the Royal College of Physicians, London; Clinical Guidelines for Type 2 diabetes: prevention and management of foot problems. Both male and female indoor patients above 15 years of age were included in the study.*

Results: *An audit of 127 diabetes mellitus patient revealed that 25 (19.68%) patients were having low current risk, 21 (16.53%) were classified as having risk foot, 6 (4.72%) were categorized as high risk patients, 16 (12.59%) were admitted with ulcerated foot and 5 (3.39%) were having diabetic foot emergency according to Royal College of Physicians, London; Clinical Guidelines for Type 2 diabetes: prevention and management of foot problems.*

Conclusion: *The main reason for poor diabetic foot outcomes in the tertiary care teaching hospital is the absence of classification of majority of diabetic patients into different risk groups for the appropriate treatment. This lack of risk classification results in ensuing gaps in the management and an overall increase in morbidity.*

Key words: *Diabetic foot, Risk classification.*

INTRODUCTION

The burden of diabetes is growing globally as the world wide prevalence of diabetes in the year 1995 was 4%, which increased to 4.35% in 2002 and at present it is 4.62%. By the year 2015 it is estimated to climb up to 4.95% and to 5.4% by the year 2025 [1].

In a survey by WHO, it was shown that in 1995 Pakistan was 8th on the list of top ten countries with high prevalence of diabetes and there were 4.3 million people with diabetes mellitus. However it is estimated that in the year 2025, Pakistan will be 4th on the list with 14.5 million people with this disease[2].

The problems of diabetic foot have become more prevalent and important as the life expectancy for a patient with diabetes has increased due to advances in the management of diabetes. Prevention programs are needed rather than just treating diabetes and its complications. Diabetic foot is one of the preventable and curable complications of diabetes. Lifetime incidence of foot ulcer in diabetes is 25%[3]. In United States, 60% of all lower limb amputation occurs amongst diabetics[4]. In Pakistan diabetes mellitus is a major cause of lower limb amputations i.e. 70.76% followed by Trauma 15.38%, gas gangrene 6.15%, tumor 4.6% and neurological involvement 1.53%[5].

The Royal College of Physicians, London; Clinical Guidelines for Type 2 diabetes: prevention and management of foot problems are the most widely used for categorization and management of diabetic foot[6]. It is based on the degree of risk these patients carry to develop diabetic foot problems and the management needed. The aim of the study was to conduct an audit of the patients admitted with diabetic foot in the study duration regarding their risk classification and management.

MATERIAL AND METHODS

This audit was conducted in the medicine department, Khyber teaching hospital Peshawar. All (127) patients of diabetes mellitus aged 15 and above of both sexes admitted from 1st October 2005 to 31st March 2006 were included in this study.

Royal College of Physicians, London; Clinical Guidelines for Type 2 diabetes: prevention and management of foot problems were taken as standard reference guidelines. A semi structured proforma was designed accordingly and the patient data was abstracted from the medical records. We analyzed the history, arrival reports, investigations, surgical notes of all 127 diabetics admitted during the study period. All the diabetics were categorized into different risk groups according to reference guidelines and analyzed whether the treatment was according to Royal College of Phy-sicians, London management protocol (Table I).

RESULTS

Out of 127 patients, 73 (58%) were male and 54 (42%) female. Twenty one (16.2%) patients sought admission for diabetic foot as primary problem while 51 (40.93%) were admitted with other complaints having element of diabetic foot risk. Fifty Four (42.51%) were not screened for diabetic foot risk (Figure 1).

A. Low current risk: Twenty Five (19.68%) patients were having low current risk i.e. normal pulses and sensations and without any risk factor such as neuropathy, peripheral vascular disease, previous ulcers, amputation, poor vision, poor foot ware, smoking, diabetes of more than 10 years duration and social deprivation. None of them received literature, pamphlets or booklets regarding preventive foot care (Table 2).

B. Risk foot: Twenty one (16.53%) patients were classified as risk foot having neuropathy, absent pulses and other risk factors as mentioned above. They had not received foot care education and advice regarding 6 monthly review from a physician and an appropriate footwear. None of theme received literature, pamphlets or booklets regarding preventive diabetic foot care (Table 2).

C. High risk foot: Six (4.72%) patients were categorized as high risk patients according to Royal College of Physicians, London diabetic foot risk criteria. They had foot deformity, skin changes, previous ulcers and risk factors as mentioned above (Table 2).

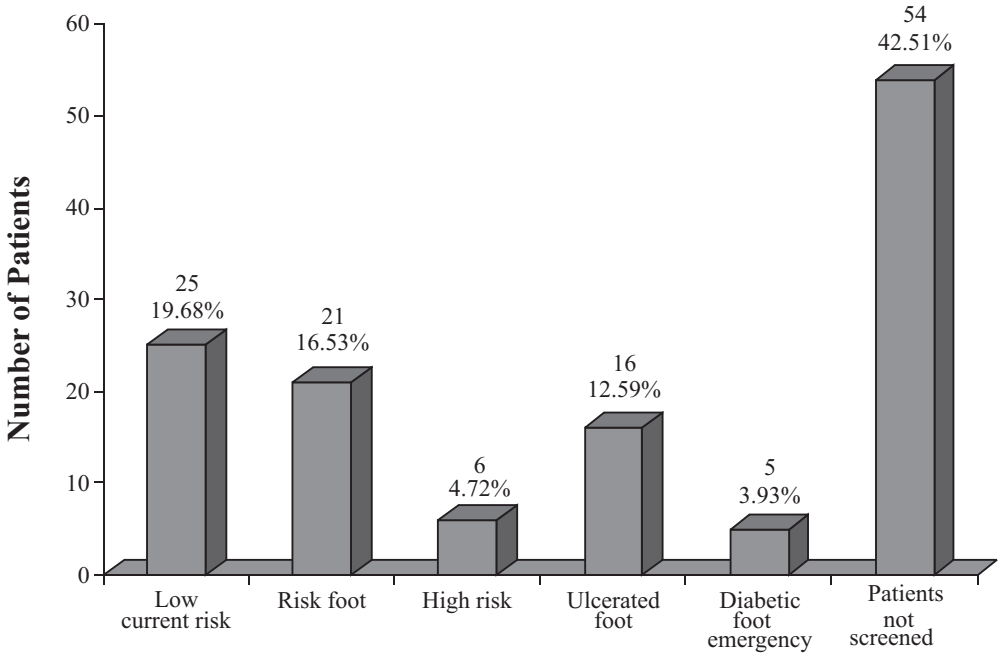
All denied information regarding 3 monthly review from a physician, special footwear and sole, skin and nail care (Table 2).

D. Ulcerated foot: Ulcerated diabetic foot included those with vascular insufficiency, wounds,

Table 1: Royal College of Physicians, London: Clinical Guidelines for Type 2 diabetes: prevention and managment of foot problems[6]

Risk	Recommendations
Low current risk (normal pulses and sensations)	● Foot care education (Foot examination by physician annually)
Risk foot (Neuropathy, Absent peripheral pulses other risk factors)	● Foot care education ● Six monthly review ● Appropriate foot wear
High risk foot (risk factors, deformity, skin changes, previous ulcers)	● Three monthly review by foot care team/physician ● Intensified foot care ● Special footwear and soles ● Skin and nail care
Ulcerated foot	● Treatment for vascular insufficiency ● Wound management, debridement, dressing ● Systemic antibiotics for cellulites, bone infection ● Special foot wear, cast ● Tight glycaemic control i.e. HbA1c<6.
Foot care emergency (New ulcerating cellulites, discoloration)	● Refer to special foot care team, surgical or orthopedic unit.

Figure 1: Risk Ditribution of Diabetic Patients (n=127)



localized cellulites or osteomyelitis. This group accounted for 16 (12.59%) of all diabetic admissions. Only 11 out of 16 patients received treatment for vascular insufficiency and 14 out of 16 patients received antibiotics for infection. Thirteen patients had access to proper dressing and debridement. No one was advised about proper foot ware and cast. In 6 patients $HbA1_c$ was done with only 1 having it less than 6 (Table 2).

E. Foot care emergency: Diabetic foot emergency included those with new ulcerating cellulitis and discoloration and accounted for 5 (3.93%) patients.

Table No. 2: Summary of audit results (n=127)

Risk group	Number of Patients	Results
Low current risk	25 (19.68%)	● None of them received foot care education ● None of them received advise about annual foot ● examination from physician / podiatrist ● No patient received booklets / literature regarding preventive foot care
Risk foot	21 (16.53%)	● None of them received preventive foot care education ● No patient was advised about 6 monthly review ● None of them received booklets / literature about foot care
High risk	6 (4.72%)	● All denied three monthly review by foot care physician
Ulcerated foot	16 (12.59 %)	● 11 (68.75%) patients received treatment for vascular insufficiency ● 14 (87.5%) patients received antibiotics for infection ● 13 (18.25%) patients had proper dressing / debridement ● 6 (37.5%) patients had HbA_{1c} done ● No patient received special footwear, cast
Diabetic foot emergency	5 (3.93%)	● 5 (100)% were referred to surgeon / orthopedic units
Patients not screened	54 (52.51%)	● These patients were not screened for diabetic foot risk

All of them were referred to surgical ward for imputation / debridement (Table 2).

F. Patients not screened: Fifty Four (42.51%) patients were not screened for diabetic foot risk (Table 2).

DISCUSSION

Worldwide diabetic foot problems are common in male[7]. Our study showed similar results and out of 73 (57.49%) patients screened for diabetic foot risk, 43 (58.90 %) were males and 30 (42.10 %) were females.

In our study 54 (42.5%) diabetics were not even screened for diabetic foot risk. The main reasons include lack of interest of the doctors, the day to day increase in work load of physicians treating diabetes and lack of professional and qualified podiatrists in Pakistan. All these contribute to the poor quality of the diabetic foot care.

Physicians receive diabetic foot problem at an earlier stage as compared to the surgical units, where patients are admitted at advanced stages. Some patient may report to surgeon directly but the vast majority is referred to them by the physicians, as part of the combined management. This is evident from our study where low current risk (19.68%) patients and risk foot (16.53%) patients presented to us in contrast to surgical units where diabetic foot problems presented at advanced stage. As shown in a local study 25%, 30%, 21% and 4% respectively presented to surgeons with Wagner's class 2 (Deep Ulcers), 3 (Osteomyelitis with ulceration are abscess), 4 (partial foot gangrene) and 5 (Gangrene of entire foot) respectively[8]. Wagner's classification is widely used by surgeons which is based on severity of diabetic foot[9].

Education of health care professionals and patients regarding diabetic foot care is an urgent need to reduce the number of amputation but our study showed that none of the patients received any such education and this may be due to the lack of training of health care professionals.

Prevention strategies such as patient education in foot care and prophylactic skin and nail care, reduce the risk for foot ulcers and amputation of lower extremities by 25% in patients with no other specific risk factor. Prescription of footwear accommodating deformity and decreasing pressure and shear forces to skin overlying bony prominences, keep individuals ambulatory and protect them from ulcer formation. A nurse trained in diabetic foot care chiropodist and provision of protective foot wear are a cost and resource effective methods of decreasing the rate of diabetic foot ulcers and the risk for eventual lower extremity amputation[10].

The quality of diabetic foot care in our setup has much room for improvement. The main problems leading to high prevalence of diabetic foot problems in our setup include lack of local clinical guidelines, poor knowledge of foot care among diabetics, lack of education about preventive foot care in general practitioners, lack of proper foot care teams, poor coordination among different disciplines, delayed involvement of discipline of prosthesis and orthroses and delayed referral of patients with foot infections to specialist.

CONCLUSION

Main reason for poor diabetic foot outcomes in our set up is the lack of classification of majority of diabetic patients into different risk groups for the appropriate treatment by the health care professionals in the tertiary care hospital.

REFERENCES

1. King H, Aubert RE, Herman WH. Global burden of diabetes, 1995-2025: prevalence, numerical estimates and projections. Diabetes Care 1998; 21:1414-31.
2. World Health Organization. The World Health Report 2003. Geneva: World Health Organization; 2003.
3. Singh N, Armstrong DG, Lipsky BA. Armstroog. Preventing Foot ulcers in Patients with diabetes. JAMA 2005;293:217-28.
4. Center for Disease Control and Prevention. Hospital discharge rate for non-traumatic lower extremity amputation by diabetes status --- United States, 1997. Morb Mortal Wkly Rep 2001; 50: 954-8.
5. Humail SM, Ilyas S, Baqai FU. Diabetic foot: Major cause of lower limb amputations. J Surg Pak 2004; 9:2-21.
6. Royal College of Physicians. The National Collaborating Centre for Chronic Conditions. Clinical Guidelines for Type 2 diabetes: prevention and management of foot problems. [Online] 2003 [cited 2009 Sep 10]. Available from URL://www.rcplondon.ac.uk/pubs/contents/31514479-7181-4aae-8e5b-b440c3e21d91.pdf.
7. Boulton AJM, Loretta Vileikyte L. Diabetic foot problems and their management around the world. In: Bowker JH, Pfeifer MA, editors. Levin and O'Neal's The Diabetic Foot. 6th ed. St. Louis: Mosby; 2001.

8. Muqim RU, Griffen S, Ahmed M. Evaluation and management of diabetic foot according to Wagner's Classification. A study of 100 cases. J Ayub Med Coll Abbottabad 2003;15:39-42.

9. Wagner FW: The dysvascular foot: a system for diagnosis and treatment. Foot Ankle 1981;2: 64-122.

10. O'Meara S, Cullum N, Majid M, Sheldon T. Systematic reviews of wound care management: (3) antimicrobial agents for chronic wounds; (4) diabetic foot ulceration. Health Technol Assess 2000;4:1-237.

Address for Correspondence:
Dr Ghulam Shabbier
Associate Professor
Department of Medicine
Khyber Teaching Hospital Peshawar - Pakistan