ORIGINAL ARTILE

Frequency of Lower Extremity Amputations in patients with Diabetics Foot Ulcers

KHALIL AHMED, JAVERIA USMAN, M ABID, *JAWAD AHMED KHAN, ZARLASHTA USMAN*

ABSTRACT

Background:*Diabetes mellitus is one of the most common non-communicable diseases globally.It is one of the major contributors to ill health and mortality worldwide. Diabetic foot ulceris a majorcomplication of diabetes mellitus, and major component of thediabetic foot.These complex chronic wounds not only lead to disability and impairment of quality of life, but are associated with high rates of hospitalization and non traumatic amputations.

Aim: To study the frequency of lower extremity amputations in diabetics, in order to identify risk groups that should be targeted for preventive treatment.

Methods: This observational study was conducted in the Department of General Surgery at Nawaz Sharif Social Security Teaching Hospital Lahore, over a period of 3 years (July 2014 to July 2017).This study carried out in 200 patients of diabetic foot disease, who were distributed in to six grades of severity according to the Wagner's classification. Age, gender, duration of diabetes mellitus and the type of lower-extremity amputations were recorded.

Results: In the current study, 200 patients including 148 males (74%) and 52 females (26%) with diabetic foot lesions were treated.Majority of the patients were in the age group between 30 -71 years (average age 55 years). 52% patients were on oral hypoglycemic agents, 46% were using insulin, while 2% were not following any treatment. Duration of diabetes was greater than 10 years in 62% of patients.Majority of the patients presented in grade III, IV and V (68%) of Wagner's classification. All the patients were lacking health education and none of them was aware of proper foot care in diabetes. No patient in grade I underwent amputation, while 11(25%), 27(58.69%) and 27(45%) underwent minor amputation in grades II, III and IV respectively.10 (21.7%), 33 (55%) and all 30(100%) underwent major amputation in grade III, IV and V respectively.

Conclusion: Diabetic foot is a leading cause of lower extremity amputations .It is a huge economic burden on the patients associated with high morbidity and mortality.The frequency of minor and major amputation increases with the increasing grades of diabetic foot. Most of the patients in our study presented with higher grades (III, IV &V) of severity and underwent major amputations.

Keywords: Lower extremity amputation, Diabetic foot, Foot ulcer

INTRODUCTION

Diabetes, "*The Mother of Diseases",* is a commonly encountered problem and the numbers affected by the Disease is increasing day by day.The World Health Organization (W.H.O.) has estimated that the global number of people with diabetes will be more than double over the next 25 years.[1]

Diabetic foot is one the major complication of Diabetes Mellitus. It not only leads to impairment in quality of life, ill health, disability and mortality of the patient but also badly affects the family of the patient, as he may be the sole earning member of the family.

Wagner's classification is the most commonly used grading system for lesions of the diabetic foot. It distributes diabetic foot lesions in six grades ranging from 0 – V, with severity of lesion increasing with the grade.[2] (Table 1)

Such grading helps to plan the management and improve outcomes. It also provides a standard format of communication between doctors and other healthcare providers.

In our study, we observed the frequency of lower extremity amputations in diabetics with reference to Wagner's grading system and tried to highlight the preventable risk factors, which are not just responsible for increased morbidity and mortality of a patient but also compromise of the whole family.

MATERIAL AND METHODS

This prospective study was conducted in the Department of General Surgery (unit 1) at Nawaz Sharif Social Security Teaching Hospital Lahore over a period of 3 years (July 2014 to July 2017).This was an observational study carried out in 200 patientsof diabetic foot disease.Approval for the study was taken from the hospital ethical committee. Diabetic patients were admitted through outdoor and

Department of General Surgery, Nawaz Sharif Social Security Teaching Hospital, University College of Medicine& Dentistry, The University of Lahore

Correspondence to DrJaveriaUsman: email: javeriausman93@gmail.com 0333-4199913

emergency department. Detailed history and clinical examination was performed to assess the general condition of the patients. Local examination of the feet and clinical assessment of vascular and neurological status was carried out. Investigations including blood counts, blood urea, serum creatinine, blood sugar and radiographs of feet were taken to assess the status of the bones. Based on the clinical & radiological findings these diabetic feet were graded according to Wagner's classification. Surgery was performed after all the investigations and adequate glycemic control with insulin and/or oral hypoglycemic drugs. Age, gender, duration of diabetes mellitus and the type of lower-extremity amputations were recorded. Major amputation was defined as amputation above the ankle while minor amputation was amputation below the ankle in the present study.

The patients were discharged when their wounds were clean, with healthy granulation and it was safe to continue their dressings at home or out patientsdepartment. Weekly follow up was carried out for a period of 2 to 6 months, depending upon the healing time of diabetic foot.

RESULTS

In the current study, 200 patients including 148 males (74%) and 52 females (26%) with diabetic foot lesions were treated.Majority of the patients were in the age group between 30 -71 years (average age 55 years). 52% patients were on oral hypoglycemic agents, 46% were using insulin, while 2% were not following any treatment. Duration of diabetes was greater than 10 years in 62% of patients.

There was no patient in grade-0, 20(10%) patients in grade-I, 44 (22%) patients in grade-II, 46(23%) patients in grade-III, 60(30%) patients in grade-IV and 30(15%) patients in grade-V respectively. Majority of the patients presented in grade III, IV and V (68%). All the patients were from working class with lack of health education and none of them was aware of proper foot care in diabetes.

Amputation (minor and major) was performed in 138(69%) patients presented with diabetic foot ulcers. Out of them minor amputation was performed in 65(32.5%) and major in 73(36.5%) and remaining 62 (31%) patient underwent wound debridement and foot was salvaged.No patient in grade I underwent amputation, while 11(25%), 27(58.69%) and 27(45%) underwent\t minor amputation in grades II, III and IV respectively.10(21.7%), 33(55%) and all 30(100%) underwent major amputation in grade III, IV and V respectively. Below-the-knee amputation was the most commonly performed procedure. Post operative complications occurred in 46(23%) patients including stump infection, wound dehiscence and recurrence of gangrene.

Table 1: Wagner's classification for diabetic foot disease (Adopted from Levin and O'Neals)[2]

Grade-0	**High risk foot and no ulceration.**
Grade -1	Superficial Ulcer.
Grade -2	Deep Ulcer (cellulitis)
Grade -3	Osteomylitis with Ulceration or abscess.
Grade -4	Gangrenous Patches. Partial foot gangrene.
Grade -5	Gangrene of entire foot.

Table 2: Sociodemographic characteristics of patients (n=200)

Characteristics	**n**	**%age**
Age/Years		
<40	16	8
41-50	84	42
51-60	68	34
61-70	20	10
>70	12	6
Gender		
Male	148	74
Female	52	26
Duration of Diabetes		
>10 years	124	62
<10 years	76	38
Treatment taken for diabetes		
Oral hypoglycemic	104	52
Insulin	92	46
None	04	2

Table 3: Number of patients according to Wagner's classification for diabetic foot disease (n=100)

Grade	**n**	**%age**
0	0	0%
I	20	10%
II	44	22%
III	46	23%
IV	60	30%
V	30	15%

Table-4: Treatment provided

Grade of DFD	**Type of Treatment**	**n**	**%age**
I	Conservative Antibiotics Incision Drainage Debridement	20	100
II		33	75
III		19	19.56
Minor Amputations			
I	Amputations below ankle	None	Zero
II		11	25
III		27	61.36
IV		27	45
Major Amputations			
I	Amputations above ankle	None	Zero
II		None	Zero
III		10	21.7
IV		33	55
V		30	100

DISCUSSION

Diabetic foot disease is a complex disease. Approximately 8.8 percent of hospital admissions of diabetic patients are for foot related problems, and such cases hospital stay is about 13 days longer than for diabetics without foot related admissions.[3] . Ulceration, infection, and gangrene of foot are the leading causes of hospitalization in patients with diabetes mellitus[4,5]

Foot ulceration affects around 15% of patients with diabetes[6,7], with a risk of amputation being 15-40 times higher than in non-diabetics[8].

In our study, we observed 200 patients with the age range between 30 -71 years andmean age was 55 years, whileAdams et-al[9] in a prospective audit studied 661 diabetic foot patients, with age range 31-99 years and median age 69 years. In our series, ages of patients were younger with high Wagner's grade. This may depicts lack of knowledge regarding self-care practices, glycemic control,proper foot wear and early reporting to the concerned healthcare provider in case of foot trauma in diabetics in our country. However, size of our study was much smaller and single centre study.

There is increased prevalence of foot ulceration in males[10,11,12,13]and according to one study male sex is associated with 1.6 times increased risk of ulcers and 2.8 to 6.5 fold higher risk of amputations[11].In our study 74% patients were male which is compatible with other studies.

Rooh-ul-Muqeem et-al[14] in their evaluation of 100 cases of diabetic foot reported that most of their patients belonged to Wagner's grade 3 & 4, which is comparable to our study.

In our study31% of patients were cured by debridement and multiple dressings and overall amputation rate was 69%, which is contrary to a local studywhere 64% patients were cured by drainage of abscess and debridement, and only 36% needed amputations[15].

Our study highlighted the fact that there was total lack of awareness about foot care in our diabetic population, worse than what other studies have shown[11]. This finding is very important as foot ulceration, particularly amputation is preventable in many cases[16]. With adequate education, routine foot care and attention to foot wearincidence of ulcers and amputations can be reduced by 44-85%[11].

CONCLUSION

In summary, lower extremity diabetic ulcers and amputations are alarming and costly problem that is increasing day by day. Educating our society regarding Diabetes Mellitus and its complication is needed and a strategy to decrease the burden of the disease should be implemented at grass root level. The task is challenging, requires finances but there is no time left for delay in this battle.

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