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Original Research Article

Clinical study of diabetic foot with different treatment modalities at Medical College Hospital Bikaner, Rajasthan, India

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ABSTRACT

Background: Diabetes is a chronic disease. Diabetes the global epidemic is rapidly increasing at an alarming rate. Developing countries like India will harbour majority of diabetic people by the year 2030. Diabetic foot are complex, chronic wounds, which have a major long-term impact on the morbidity, mortality and quality of patients' lives.
Methods: Hospital based prospective study. From August 2015 to July 2016. 50 patients reporting to the General Surgery department within study duration and eligible as per inclusion criteria will be included in the study.
Results: In present study, maximum 52% patients belonged to age group was 51-70 years followed by 13 (26%) in 31-50 age group. In present study most common complication of diabetes was cellulitis (32%) and least common complication was abscess (18%). In this study, most common lesion was right dorsum of foot 11 (22%) followed by left toe 7 (14%). Maximum 30% patients were treated through debridement of diabetic foot whereas 20% patients received slough excision, dressing and skin graft and toe amputation as treatment modality. 18% patients were treated by I and D. Amputation was the least used treatment modality.
Conclusions: Diabetes mellitus is a lifelong disease and diabetic foot complications can be life threatening, physically incapacitating, costly to treat and result in extensive morbidity.

Keywords: Diabetes, Foot ulcers, Neuropathy

INTRODUCTION

Diabetes mellitus is as old as mankind and perhaps humans know it from early ages. It is one of the most deeply studied disease and is still un-understandable ailment that human deal with. As we are digging deeper into the molecular basis of the disease mind boggling results are coming out. It is not a single disease but a constellation of diseases that it gives birth to i.e. the complications.

Diabetes mellitus is characterized by chronic hyperglycaemia and disturbance of carbohydrate, fat and protein metabolism associated with absolute or relative deficiency in insulin secretion and/or insulin action.[1]

Diabetes is known for its micro and macro vascular complications like retinopathy, neuropathy, cardiovascular and peripheral vascular disease. One of the most devastating complications of diabetes is 'diabetic foot' which is responsible for >50% non-traumatic major limb amputations.[2]

The World Health Organization (WHO) defines diabetic foot as the lower limb of a diabetic patient that has the potential risk of pathologic consequences, including infection, ulceration and/ or destruction of deep tissues associated with neurological abnormalities, various degree of peripheral neuropathy, vasculopathy and superimposed infection are mainly responsible foot ulceration. Ulcers which develop are difficult to treat due

to poor wound healing which results from a combination of neuropathy, ischemia and hyperglycaemia.

An inciting event such as unnoticed trauma through which micro-organisms gain entry, sluggish leukocyte response and high sugar content leads to destruction of proper host defence mechanisms which spread in subcutaneous and sub facial planes to the deeper tissues. Superficial ulcers are mainly colonized by staphylococcus aureus and/or streptococcus pyogenes while deep infections like osteomyelitis and abscesses result from a combination of aerobic and anaerobic micro-organism (gram positive cocci, gram negative bacilli like *Escherichia coli*, *proteus* and *Klebsiella sp*. and anaerobes including *Bacteroides* and *Peptostreptococci*).[3-5]

METHODS

It was a hospital based cross sectional study conducted for a period of six months (March to August 2016) at the Department of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner, Rajasthan, India.

Study population

All patients of diabetic foot attending to Department of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner, Rajasthan, India.

Sample size

50 patients reporting to the Surgery department within study duration and eligible as per inclusion criteria.

Inclusion criteria

All patients of diabetic foot who gave informed verbal consent.

Exclusion criteria

Diabetic foot associated with venous ulcers and lymphedema.

Assessment tool

Pre-designed Pre-structured questionnaire containing questions regarding clinical history, demographic data, risk factors for limb amputations and various treatment modalities was used.

Study methodology

After obtaining permission of Institutional Ethical Committee and obtaining informed verbal consent from eligible study participants, all details of patients along with relevant investigational details were recorded in questionnaire.

Data analysis

Data thus collected were entered into excel and were then analyzed with help of SPSS software through tables, diagrams and appropriate statistical test wherever required.

RESULTS

In present study, maximum 52% patients belonged to age group was 51-70 years followed by 13(26%) in 31-50 age group, 3 (6%) cases in 0-30 age group and 8 (16%) cases in more than 70 year age group.

Table 1: Distribution of cases according to age (N=50 cases).

Age group (years)	Number	Percentage
0-30 years	3	6%
31-50 years	13	26%
51-70 years	26	52%
>70 years	8	16%
Total	50	100%
Means age (years)	54.64	
SD	19.57	

Table 2: Distribution of cases according to sex (N=50 cases).

Sex	Number	Percentage
Male	39	78%
Female	11	22%
Total	50	100%

Table 2 shows that male patients (78%) contributed to larger proportion of our study population as compared to females (22%).

Table 3: Distribution of cases according to site of lesion involved (N=50 cases).

Lesion	Number	Percentage
Left dorsum of foot	3	6%
Left toe	7	14%
Left fore foot	4	8%
Left plantar foot	2	4%
Left whole foot	5	10%
Right dorsum foot	11	22%
Right toe	4	8%
Right fore foot	4	8%
Right plantar foot	4	8%
Right whole foot	3	6%
Right heel	3	6%
Total	50	100%

In this study, most common lesion was right dorsum of foot 11 (22%) followed by left toe 7 (14%), left whole foot (10%).

Table 4: Distribution of study population according to complications of diabetes.

Complication of diabetes	Number	Percentage
Cellulitis	16	32.0%
Abscess	9	18.0%
Ulcer	14	28.0%
Gangrene	11	22.0%
Total	50	100%

In present study most common complication of diabetes was cellulitis (32%) and least common complication was abscess (18%).

Table 5: Distribution of study population according to duration of diabetes.

Duration of diabetes	Number	Percentage
≥10 Years	32	64.0%
<10 Years	18	36.0%
Total	50	100.0%

Table 5 shows that out of 50 patients, 60% patients were suffering from diabetes for ≥10 years whereas 36% patients were having diabetes for less than 10 years duration.

Table 6: Distribution of cases according to treatment modalities.

Treatment modalities	Number	Percentage
B/K amputation	4	8.0
Debridement	15	30.0
I and D	9	18.0
Mid-thigh amputation	2	4.0
Slough excision, dressing and skin graft	10	20.0
Toe amputation	10	20.0
Total	50	100.0

Table 6 shows that maximum 30% patients were treated through debridement of diabetic foot whereas 20% patients received slough excision, dressing and skin graft and toe amputation as treatment modality. 18% patients were treated by I and D. amputation was the least used treatment modality.

DISCUSSION

This hospital based cross-sectional study was conducted in surgery dept. PBM hospital Bikaner attached with S.P.M. College Bikaner, Rajasthan, India. 50 patients reporting to the General Surgery department within study duration 6 months (March to August 2016) and eligible as per inclusion criteria were included in the study.

Lock W did a study which revealed that the youngest age with diabetic foot was 32 years and the oldest age was 89 years.[6] In the present study, maximum 52% patients belonged to age group was 51-70 years followed by 13 (26%) in 31-50 age group, 3 (6%) cases in 0-30 age group and 8 (16%) cases in more than 70 year age group.

When compared with Lock W series, there is not much difference in the oldest group but the youngest patient was found to be 16 years younger than the compared study.[6]

Mayfield et al did a study on sex wise distribution of diabetic foot which included 32 males and 29 females.[7]

In present study 60% patients were suffering from diabetes for ≥10 years whereas 36% patients were having diabetes for less than 10 years duration and same result were observed in Rawels et al.[6]

In present study most common complication of diabetes was cellulitis (32%) and results were found in Bell et al and diabetic research center study.[8,9]

In this study minimal stay in hospital was for the patients who had abscess or cellulites in which most common procedure performed was IND and debridement.

In this study, most common lesion was right dorsum of foot 11 (22%) followed by left toe 7 (14%), left whole foot (10%).

Apelquist et al found that among the patients with diabetic foot 51% involved the toes, 14% involved the dorsum of foot and 9% involved the plantar heel.[10]

Reiber et al found that 52% involved the toes, 11% involved the dorsum of foot and 18% involved the plantar heel.[11]

In present study maximum 30% patients were treated through debridement of diabetic foot whereas 20% patients received slough excision, dressing and skin graft and toe amputation as treatment modality. 18% patients were treated by I and D. amputation was the least used treatment modality.

In Collen et al study 38.6% underwent amputation and in Miyajima S et al 52% underwent amputation.[12,13]

CONCLUSION

Diabetes mellitus is a lifelong disease and diabetic foot complications can be life threatening, physically incapacitating, costly to treat and result in extensive morbidity.

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