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AMPUTATION IN DIABETIC FOOT

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ABSTRACT

Objective: To assess the frequency of amputation in diabetic foot with morbidity and mortality.
Methods: The study was carried out at the department of Orthopaedic Surgery and traumatology Unit -1, Liaquat University of Medical and Health Sciences Jamshoro from July 2007 to June 2008. The study design was prospective. All type II diabetes patients having foot complications were included and patients with type I diabetes were excluded from the study. All the patients were assessed by the Wagner's grading system of diabetic foot and the most common grade of diabetic foot in this study were grade II and III. Operative procedures were, wound debridement, incision and drainage, small and big toe amputation, below and above knee amputation.
Results: Total number of patients was 58; there were 39(67.24%) male and 19(32.75%) female patients with male female ratio of 3:1. Age ranged between 30 to 70 years with average age 52 years. Wound debridement was done in 14(24.15%) patients, below knee amputation 12(20.69%), above knee amputation 09(15.52%), small toe amputation 11(18.96%), big toe amputation in 07(12.06%) and incision and drainage in 5(8.62%) patients. Overall amputation rate in the study was 39(67.24%) patients with minor amputations in 18(31.4 %) patients and 21(36.20 %) major limb amputation. Mortality rate in this study was 08(13.7 %). Mild Phantom pain was reported by 53%.
Conclusion: We conclude that diabetic foot is leading cause of amputations resulting in high morbidity and mortality. These complications can be prevented by early detection, adequate glycemic control and timely referral of diabetic foot patients to specialists. Patient's education and training to general practitioners at district level about foot care are the most important measure to curtail disabilities resulting from diabetic foot

KeyWords: diabetic foot, amputations

INTRODUCTION

Diabetic foot is among the most feared complication of diabetes mellitus, ultimate end point of diabetic foot disease is amputation associated with high morbidity and mortality[1]. It is estimated that 221 million people will be affected with diabetes globally in 2010[2]. Peripheral vascular disease associated with diabetes mellitus results in blindness, renal complications, limb ischemia, and lower extremity wounds in many patients. Diabetic foot is the main cause of non –traumatic lower extremity amputation early recognition and management of risk factors for foot complication may prevent amputations and other adverse effects[3]. Despite efforts to control diabetes and improve limb salvage rates, the number of amputations performed in the United States

because of diabetes continues to rise[4].

American diabetic association, 2003 in a consensus statement on foot care, has identified four conditions that are associated with increased risk of amputation. These include peripheral neuropathy, altered biomechanics, including pressure callus and limited joint mobility, peripheral arterial disease, history of ulcer or amputation[5]. Diabetic complications are associated with high amputation rates. Among the amputations performed for all the conditions including trauma, bone tumors, peripheral vascular disease diabetes mellitus remains the major cause. Good diabetic control and detection of early diabetic foot complication will reduce the number of patients under going limb amputation as well as number of amputees[6]. Foot related disease is most common cause of hospital admissions among the diabetics and is recognized as common cause of non –traumatic lower limb amputation. People with diabetes are 20 times more likely to undergo an amputation then rest of the population[7].

In our local circumstances diabetic foot patients arrive at tertiary care centers very late due to lack of facilities at regional centers. Majority of patients with diabetic foot are initially treated by non qualified persons due to poor socio-economic situation. At the time of arrival of patients to specialists foot conditions are so advanced that amputation remains the only option to save patients life. Patients report to the hospitals with poor glycemic control. In our local circumstances diabetic foot is a neglected entity which can be prevented by adequate care and awareness of public and timely referral to special units.

OBJECTIVE

To assess the frequency of amputation in diabetic foot patients with morbidity and mortality.

MATERIAL & METHOD

62 patients of diabetic foot were included in this study from July 2007 to June 2008 for the period of 01 year at the department of orthopedic surgery & traumatology Liaquat University of Medical and Health Sciences Jamshoro. Four patients were lost in follow-up so finally 58 patients were studied. All type 11 diabetes patients with foot complications were included and type I diabetes were excluded from the study. The patients were admitted through emergency or outpatient department.

After admission detailed history of patients and general clinical examination was performed. Local examination of feet and lower limb was done to evaluate the condition of feet.

All the patients were investigated to assess the general condition with the help of complete blood counts, blood sugar level, and blood urea and serum creatinine to evaluate renal status. Most of the patients' blood sugar was controlled by administration of insulin. Anterioposterior and lateral radiographs of feet were taken to evaluate bone involvement. All the patients were assessed according Wagner's classification.

After achieving blood sugar control patients were operated for wound debridement, small toe amputation, big toe, incision and drainage, below knee amputation or above knee amputation

Follow-Up of the Patients

All the patients were followed up to assess the progress. Minimum follow –up time in our study was 15 days to 06 months. After operation wound dressings were performed till the healing of the wound. Those patients who under went above knee or below knee were examined weekly and fortnightly to evaluate the wounds. Patients with infected wounds were followed up in OPD or operation theatres and multiple dressings were done till complete healing. Skin grafting or secondary wound closures were performed to cover the wounds. Total patients of major limb amputations were followed up till wound healing and then below or above knee prosthesis were advised.

Appropriate antibiotic therapy was given to the patients with infected wounds.

RESULTS

Total number of patients was 58; there were 39(67.24%) male and 19(32.75%) female patients with male female ratio of 3:1. Age ranged between 30 to 70 years with average age 52 years. Common age group in this study was 5th and 6th decade of life. As regards the mode of presentation is was assessed according to Wagner's classification. Out of total 58, Grade I were 09(15.52%) with foot ulcers. Grade II, 15(25.86%) cellulitis foot, grade III, 13(22.42%) with small, big toe and forefoot gangrene and heel abscess, grade IV 12(20.68%) and 09(15.52%) patients had foot and leg gangrene (table 1).

Total 58 patients operated there were 21(36.20%) patients underwent major limb amputation 12(20.69%) below knee and 09(15.52%) above knee amputation. Wound debridement was done in 14(24.15%), small toe amputation 11(18.96%), big toe amputation in 07(12.06%) and incision and drainage in 5(8.62%) patients. Overall amputation rate in the study was 39(67.20%) (Table 2). 08(13.79%) expired, 3 due to septicemia with necrotizing fascitis during post operative period within 10 days—20 days , 03 due to renal failure during follow – up within 03 months and 2 due to myocardial infarction within 04 months with mortality rate of (13.79%).

Foot salvage was 63.80% in our study. Infection occurred in

TABLE – 1
WAGNER'S GRADING OF DIABETIC FOOT
N=58

Wagner's grade	No of patients	Percentage
Grade 0	Nil	00
Grade 1	9	15.52
Grade 11	15	25.86
Grade 111	13	22.42
Grade 1V	12	20 .68
GRADE V	09	15.52

TABLE – 2:
OPERATIVE PROCEDURES
n=58

Procedure	No of patients	Percentage
Wound debridement	14	24.14
Below knee amputation	12	20 .68
Toe amputation	11	16.96
Above knee amputation	09	15.52
Big toe amputation	07	12.07
Incision drainage	05	8.63

TABLE – 3:

Causative organism	No of patients	Percentage
Staphylococus aureus	09	50 %
E. coli	4	22.23 %
Klebsiella	2	11.12%
Peudomonos	2	11.12 %
Proteus	1	11.50 %

18(31.3 %) patients with positive cultures and most common micro-organism was staphylococcus aureus. (Table- 3)
Complications of surgical procedure was infection of stump in 7 patients, wound dehiscence in 3, revision of stump in 2, recurrence of gangrene in 2. Below and above knee amputated 21 stumps also developed mild phantom pain in 12(53%) and phantom limb in 03(14.28%).
Most common organism was staphylococcus aureus. Appropriate antibiotics were administered to control the infection. Patients with infected wounds were followed –up and multiple dressings were performed till healing.

DISCUSSION

Diabetes is associated with multiple problems including coronary artery disease, nephropathy, retinopathy, and diabetic foot infections and gangrenes which results in high morbidity and mortality. Foot ulcers in most cases caused by combination of risk factors associated with chronic complications of diabetes. Long term hyperglycemia leads to micro-vascular disease that damages the small vessels and causes malfunctioning of nerves lone Gale L et-al [8]
Roohul Muqueem et-al.[9] in his study of 100 patients with diabetic foot reported 48 % total amputation rate Mivajima S et-al [10] presented a series of 210 diabetic 52 % of patients required limb amputation. In this study major amputation rate was 67. 56 % which higher is higher reason may delay presentation of patients in our set up.
Gul A et-al.[11] presented a study of diabetic foot disease with 200 patients of diabetic foot ulcers there were 65% males and 35% female with average age 0f 53.40 yrs in our study males were 74 % males and 26% female patients with average age 52 yrs our study matches with this study regarding presentation of age and male female ratio.
Amputation rate in a series of cases presented by Ghanassia E et- al.[12] Ninety four hospitalized diabetic foot patients 39 (43..8 %) patients underwent amputation 24 major and 15 major ,in our series total minor and major amputations were 39 (69%) out of 58 patients, so amputation rate in our series is high due to late arrival

G – II, WOUND DEBRIDMENT (FOOT SAVED)



G – II, BEFORE & AFTER DEBRIDMENT, WOUND HEALED WITHOUT SSG



G – V, BELOW KNEE AMPUTATION

to tertiary care centers. Major amputation rate can be reduced after starting multidisciplinary diabetic foot care team, which is not established in our local circumstances.

As regards the infection of diabetic foot is concerned, Vanesa Prado dos Santos et-al.[13] presented a series of patients with diabetic foot. Total 99 patients were included with infected lesions. Out of 118 positive cultures staphylococcus aureus was the commonest micro-organism in about 50% patients in our series out of 58 patients 18 patients had positive cultures and staphylococcus was the commonest organism in 09 patients with the rate of 50 %.Mortality rate in our study was 13.44 %.. Ezio fagila et-al [14] 0presented studies of 564 of diabetic foot patients and vascular surgeries were performed for re-vascularization, major amputation rate was 9.8% and mortality rate among the amputees was 28.2 % while in our series among the amputees mortality rate was (38%). In our set up revascularization facilities are not available in our society patient presents with established gangrene and there is no other option than amputation. Mortality rate was 28.2 in the study presented by Ezio fagila et-al. In our study among 21 amputees mortality rate was 8(38 %) patients. Mortality rate is much higher. Our series reflects that due to lack of education and awareness of foot care in diabetics there is high amputation rate and high mortality and many patients loose their limbs and become disabled.

CONCLUSION

Diabetic foot is the sequel of diabetes mellitus leading to high amputation rate and high mortality. These disastrous complications can be prevented by adequate management of diabetes with glycemic control and public awareness regarding foot care. Early detection and timely referral to the specialists and multidisciplinary approach can curtail the complications of diabetes mellitus and diabetic foot. In our local circumstances diabetic foot disease results in high mortality and morbidity.

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