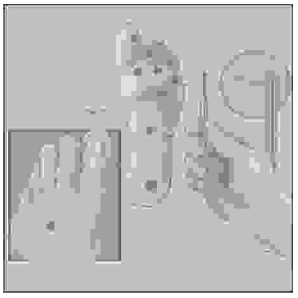
ORIGINAL PROF-1061

DIABETIC PATIENT;
LOWER EXTREMITY AMPUTATION



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ABSTRACT... Introduction: Limb loss is most feared complication of diabetes. The statistics associated with amputation create a very real concern. Fifty percent of all non-traumatic amputations occur in the diabetic patient. The risk of a leg amputation is 15 to 40 times greater for a person with diabetes. Each year, six of every thousand diabetic individuals undergo surgery for an amputation. **Objectives:** To evaluate the frequency of lower limb amputations in diabetic patients, hence emphasizing the importance of timely surgical intervention in salvage of lower limb and to reduce the morbidity and mortality. **Study design** Descriptive study. **Setting:** Surgical OPD, Causality Ward and Medical Unit, Nishtar Hospital Multan. **Duration:** One year. **Material and methods**: 100 patients. **Results:** The incidence of amputations rose steeply with age; most amputation occurred in patients over 60 year. The incidence was a higher in men than in women. The incidences of major amputations were 32% than that of minor amputations. Nearly 40% of all subjects under going afoot level amputation had a previous history of foot amputation. However nearly 40% of all subjects under going a foot level amputation had not been diagnosed either before or during admission with peripheral arterial occlusive disease, suggesting a casual pathway dependent primarily on neuropathy. The main out come variables were the number of repeat operations and hospitalization for salvage of limb with recurrent or persistent infection, and time to complete forefoot healing or foot amputation **Conclusions**: Amputations performed at healthy zones reduce the hospital stay of the patient but mortality was more consistently for proximal amputations. Better screening of diabetic patients with appropriate risk directed treatment at primary care level might significantly impact the large number of preventable diabetes related lower extremity amputations.

Key words: Amputations, Neuropathy, Diabetes.

INTRODUCTION

Limb loss is most feared complication of diabetes. The statistics associated with amputation create a very real concern. Fifty percent of all non-traumatic amputations occur in the diabetic patient[1]. The risk of a leg amputation is 15 to 40 times greater for a person with diabetes. Each year, six of every thousand diabetic individuals undergo surgery for an amputation[2]. Ablation of a limb has devastating implications for the diabetic individual. After amputation of a leg, two thirds of the diabetic patients will not be alive in five year[3]. Education of the diabetic patient and frequent foot examination has been shown by Davidson et al[2] to decrease the amputation rate by fifty percent. In spite of these hopeful

statistics Cohen et al[4] found that forty percent of all patient entering the examination room wearing shoes did not receive specific foot examination Bailey et al[5]. found that patient who presented to the examining physician with out shoes were three times more likely to have their feet examined.

Foot ulceration with secondary infection represents the number one cause for hospital admission in-patient with diabetes[6] and disables approximately twenty five percent of these patient[7]. An epidemiological study suggests that interrelated process of ulceration, infection and gangrene may carry a prevalence of ten percent in diabetic patient[8].

The management of lower extremity ischemia in the diabetic patient is a problem of enormous impact. The propensity toward gangrene puts diabetic patient at particularly high risk for amputation. In deed, the mean interval from the diagnosis of diabetes to amputation was 13 year in one study[9]. The tremendous commitment of health care resources in USA to this problem is reflected in the estimated 500 million to 1.2 billion dollars spent on approximately 50, 000 amputations performed annually in the diabetic population[9].

It is worth mentioning that in developing and underdeveloped countries, with poor socioeconomic conditions and lack of education, the patient suffer from trauma of foot when they go bare footed and burn their feet as they sit close to fire in winter season.

PURPOSE OF STUDY

The purpose of the study is to reduce the prevalence of diabetes-related foot problems and the rate of LEAs by improving access and reducing disparity in foot care services to the population served.

MATERIAL AND METHODS

Setting
Surgical Units, Nishtar Hospital, Multan

Duration
One year

Sample Size
100 patients

Study design
Descriptive study

Inclusion Criteria
1. Patients with type-II diabetes mellitus are having wound on lower extremity.
2. Patients with grade 3, 4 and 5 diabetic foot.

Exclusion Criteria
1. Patients with type-I diabetes mellitus and type-II diabetes mellitus without wound on lower extremity.
2. Patients with grade 0, 1 and 2 diabetic foot.

Data analysis
Descriptive statistics used because this is a descriptive study design. No P- value or inferential tests are required. Descriptive statistics calculated through SPSS-10.

RESULTS

Out of 100 patients, 80 (80%) patients were male and 20 (20%) were female as shown in Fig-1.

Sixty-five (65%) patients were above the age of 60 years where as 25 (25%) patients were between 50 and 60 and the rest of the 10 (10%) patients were below the age of 50 (Fig-2).

Most of the patients i.e. 72 (72%) patients were admitted through emergency ward (Fig-3).

Most of the patients 70 (70%) were on insulin therapy as shown in Fig-4.

Trauma and smoking as well as poor foot hygiene were major risk factors as shown in Fig-5.

Staphylococcus aureus was the most common organism cultured as shown in Fig-6.

Fig-1. Sex distribution

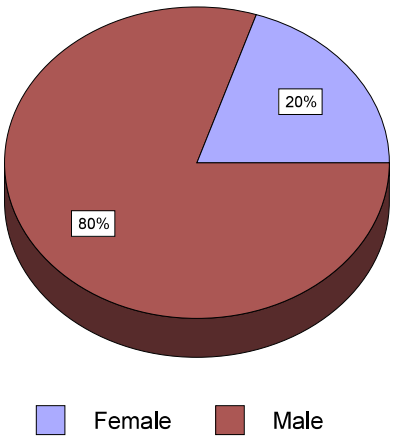
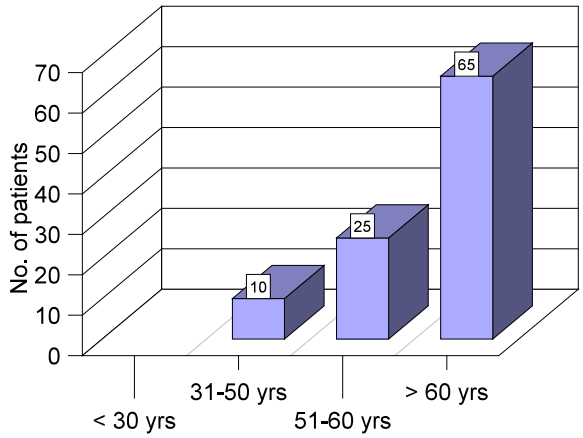


Fig-2. Age distribution



Most of the patients were in grade IV according to Meggit-Wagner classification as shown in table-I.

The choice of amputation performed along with the results is shown in table-II and is as under (Table-II).

Ten patients under went a proximal amputation for final recovery. Six patients subjected to BKA had already under gone a foot level and two patients were subjected to AKA as shown in table-III.

One patient who presented with gas gangrene in emergency ward and AKA was done could not survive after three days because of CRF, septicemia and uncontrolled diabetes. One patient with BKA died on 5th day because of renal failure rehabilitation was more successful in patient BKAs as shown table-IV.

Major operative mortality was with AKAs as shown in table-V.

Fig-3. Mode of admission

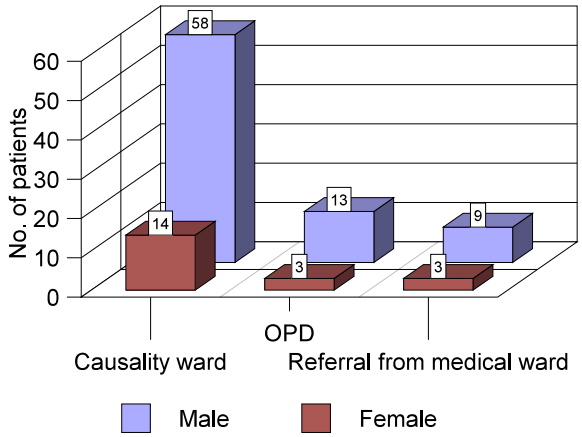
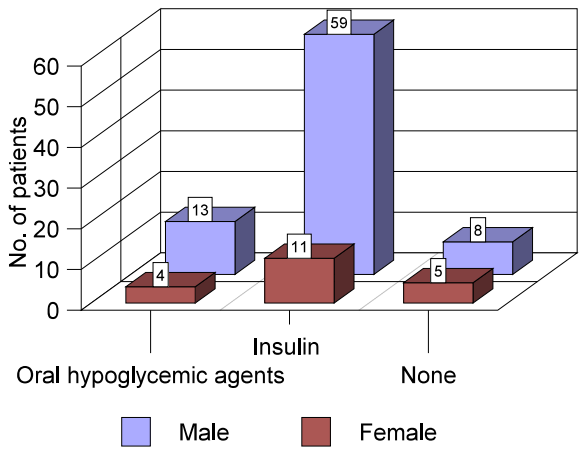
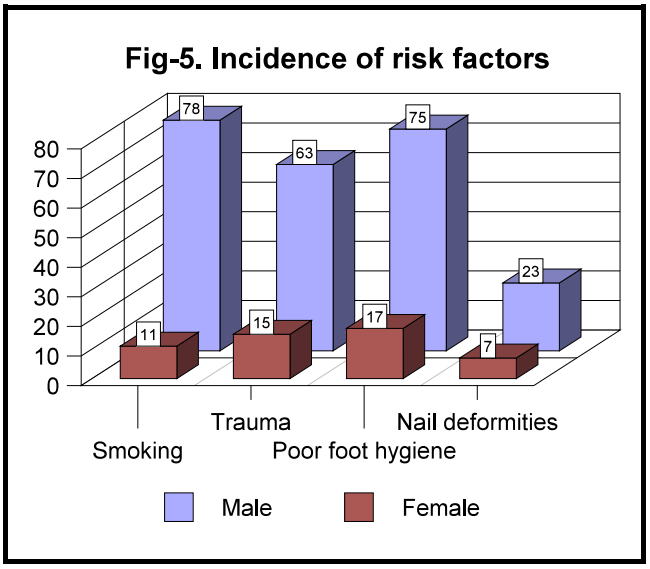


Fig-4. Proliferative treatment of diabetes mellitus





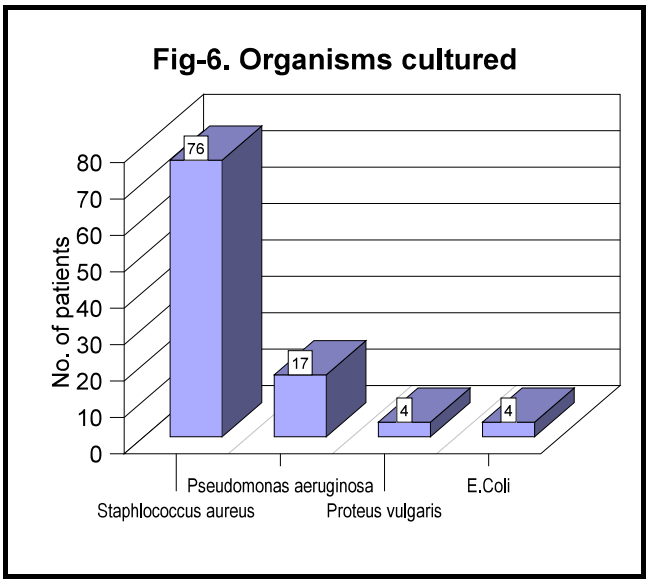


Table-I. Mode of clinical presentation according to meggit-wagner classification

Grade	Male	Female	Total
III	18 (22.5%)	04 (20%)	22 (22%)
IV	51 (63.75%)	12 (60%)	63 (63%)
V	11 (13.7%)	04 (20%)	15 (15%)

DISCUSSION

Diabetes Mellitus was described and researched extensively by the physician of ancient ages e.g. Egyptians, Chinese, Japanese, Muslims, and Europeans. Today, diabetes has reached epidemic proportions. The incidence of diabetes mellitus in Pakistan has been estimated to be about 10 -15 % at one time[10]. Diabetes is one of the most common chronic medical conditions in the world affecting approximately 30 million people of all age groups. The increased incidences are due to improved data collection and record keeping facilities. The variability detected using of different methodological technique to determine incidence rates is considerable and may have significant consequences when rates from different studies are compared.

Table-II. Amputations performed

Mode	Male	Female	Total
AKAs	10 (12.5%)	02 (10%)	12
BKAs	17 (21.2%)	03 (15%)	20
Hind foot	-	-	-
Syme resection	02 (0.5%)	01 (5%)	03
Lisfranc disarticulation	01 (1.25%)	01 (5%)	02
Transmetatarsal amputation	18 (22.5%)	05 (25%)	23
Ray amputation	23 (28.7%)	05 (25%)	27
Toe disarticulation	11 (13.75%)	03 (15%)	13

Table-III. Reamputation

Reamputation level	No of patients	%age
More proximal foot level	10	14.7
BKAs	06	30
AKAs	02	16.6

The management of lower extremity ischemia in the diabetic patient is a problem of enormous impact. The

propensity toward gangrene puts diabetic patient at particularly high risk for amputation It is worth mentioning that in developing and underdeveloped countries, with poor socioeconomic conditions and lack of education, the patient suffer from trauma of foot when they go bare footed and burn their feet as they sit close to fire in winter season.

Table-IV. Rehabilitation in AKAs and BKAs	
Mode	**Successful**
AKAs	46%
BKAs	74%

Table-V. Operative mortality	
Mode	**%age**
More proximal foot level	00
BKAs	08
AKAs	05

Limb loss is most feared complication of diabetes however 40 to 50 % 0f these are preventable. The tremendous commitment of health care resources to this problem is reflected in the estimated 500 million to 1.2 billion dollars spent on approximately 50, 000 amputations performed annually in the diabetic population[11]. In my study 41.9% of diabetic patients with foot related problems under went an amputation. Sixty-five (65%) of the amputees were above the age of 60 years as type II diabetes mellitus has increased prevalence in elderly. Most of the patients presented late with severe infection as (72%) of them were admitted through emergency ward. Seventy (70%) of the patients preoperatively were on insulin therapy while remaining was put on insulin therapy straight away. Outdoor activities prone male gender to trauma and hence to an amputation.

Higher prevalence or severity of risk factors may explain the excess mortality in the rural diabetics who were at significantly higher risk to undergo a lower extremity amputation than was the urban population.

As the saying goes "the longer the stay in the hospital, the more problems faced by the hospital and the patient himself, so no stone was left unturned to shorten the patient's stay in the hospital.

Duration of hospitalization was 1-184 days with mean of 19 days for diabetic foot problems as compared with 1-116 days with mean 8 days for other causes in a study conducted in New Zealand[12]. Duration of hospitalization was 3-26 days with mean of 11 days in one study conducted at Mayo Hospital Lahore[13].

In comparison to above studies my study showed hospital stay of 8-60 days with mean of 15 days, which is compatible with others. Mortality was more frequent for proximal amputations.

In a study conducted in USA the complete healing was achieved only in 33 of 97 limbs (34%). The primary amputation healed (with out persistent infection) only in 38 limbs (39%), at a mean time of 13 ±10 weeks[14]. In my study complete healing was achieved only in 72 of 100 limbs (72%). The primary amputation healed (with out persistent infection) only in 31 limbs (31%), at a mean time of 9 ±6 weeks.

The laboratory role is to help define what organisms are present and therefore guide the choice of antibiotic[15]. Culture and sensitivity acts as a sure load star to appropriate and antimicrobial therapy and antibiotic therapy should be aimed at a mixed aerobic and an aerobic flora. Infection may require three months to one year. Commonly found organisms were Staphylococcus aureus 76%. A comparison of incidence of infection is given below[13].

Conventional wisdom is that poor glycemic control enhances the susceptibility of the patient to infection and lead to dead wound healing[16]. In the post operative management of all cases, serial blood glucose level including both fasting and random were closely monitored. This is of great importance because had the

diabetes not been adequately and effectively monitored and controlled, the feet wound would never have healed[13].

Poor blood sugar control, long duration of the diabetes, and poor preventive health care are risk factors for later amputation. Many of the amputations reported recently may have been preventable. As regards the amputation, it can be avoided by timely and proper debridement. But once it becomes inevitable, it should be done carefully through healthy tissue, so that it is compatible with good limb functions and need for re-amputation does not occur. For people with diabetes, complications such as infection or injury can be particularly serious when they affect the feet. By following these simple steps for taking care of feet, one can greatly reduce the risk of increasing problems. Check your feet. Look for any changes. Keep your feet clean. Careful nail trimming remains the important component of prophylactic care[17]. Go soft on your skin. Avoid the heat. Listen to your health care experts. Let your clothes stay loose. Be careful with sharp instruments. Maintain a proper weight. Be kind to your feet. Kick the smoking habit. Usage of prevention foot safety insoles

All above in the discussion implies that better screening of diabetic patients with appropriate risk directed treatment at the primary care level might significantly impact the large number of preventable diabetes related lower extremity amputation.

A comparison of incidence of infection		
Infective agent	**Present study 2000- 2001 No. of pts (%)**	**Mayo hospital study 1995 no. of pts (%)[18]**
Staphylococcus aureus	76	48 (72%)
Pseudomonas aeruginosa	17	42(64%)
Proteus vulgaris	4	4 (6%)
E. coli	3	2 (3%)

CONCLUSIONS

Economic stagnation, social backwardness, illiteracy, superstition and unqualified quacks, are the main factors for higher amputation prevalence in our country. A team approach to treating and monitoring this disease serves the best interests of the patient. Identifying asymptomatic persons earlier in the disease process will allow earlier institution of lifestyle changes and medical therapy that may decrease the complications of hyperglycemia. People with diabetes can reduce their risk for complications if they are educated about their disease, learn and practice the skills necessary to better control their blood glucose levels. Foot salvage restoration of maximum function of the limb and early rehabilitation has been the best strategy for the management of diabetic foot lesions. Amputations performed in the healthy zone resulted in drastic reduction in the period of hospitalization, in contrast to the approach of carrying out amputations at the biological level. Men mainly under go an amputation, as they are engaged more in out door activities in our social set up, hence at high risk of injury to the foot. The compliance of the part of patient as regards effective glycemic control is for most importance. Increasing trend of smoking is contributing a lot to the development of foot lesions.

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Coffee should be black as Hell,
strong as death,
and sweet as love.

Turkish proverb