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INCIDENCE OF DIFFERENT TYPES OF AMPUTATION IN DIABETIC FOOT ULCER (A PROSPECTIVE STUDY)

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Abstract:

Objective: *The aim of this study was to determine the frequency of different types of amputations in diabetic foot ulcers.*

Study Design: *A Prospective Study.*

Place and Duration: *In the Surgical Unit II of Holy Family Hospital, Rawalpindi for one year duration from July 2017 to July 2018.*

Methods: *In this study, all diabetic foot ulcers patients of four and fifth grade were included in the study. Standard hip disarticulation, amputation up to above or below knee ray amputation was performed accordingly.*

Results: *A total of 53 patients were included in the study. The male patients were 30 years old, women were 23 years old. The minimum age was 30, the highest was 80 and the mean age was 58.26. According to Wagner's classification, 9 patients had stage 4 and 5 had left-sided amputation in 28 patients (52.2%) had 25 patients (47.2%) had right sided. Big toe Amputation was performed in (9.6%)5 ,2 toe amputated in (3.8%) patients, in 1 patient little toe amputation was done. Trans knee amputation in1 (2.0%), in 34 (61.93%) patients below knee amputation, in (2.09%) patient hip disarticulation and in 10 (18%) above knee amputation.*

Conclusion: *The final results of a prospective study indicate that diabetic foot ulcers efficacy is associated with longer duration of diabetes and poor glycemic control. Non-traumatic diabetic ulcers and lower extremity amputations are costly and an important issue for patients, government and health care system.*

Key words: *Ulcer, diabetic foot, Wagner grade, amputation.*

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INTRODUCTION:

Insulin-dependent diabetes mellitus (IDDM) and Non-insulin dependent diabetes mellitus (NIDDM) have two common and serious complications associated with significant mortality, foot ulcers and amputation. Foot ulcers are lesions that cause epithelial loss, sometimes have dermis that hold the bones and muscles, and have ruptured skin that can spread to deeper layers. Amputation is the operation of a terminal of a limb-free part. Diabetes is one of the main causes of amputation of the lower extremities worldwide. Amputations among people with diabetes are 16 times more common than other population. In people diabetic people all amputations occur of approximately 50%. Amputations are performed when the foot or leg recovery efforts are not successful or the infection causes extensive tissue damage. Diabetic foot infections may spread to the leg. A serious infection can be dangerous to health. In these cases, an amputation can save lives. Recent epidemiological data on new ulcers and amputations are just over 2%. In the general population, the annual frequency of foot ulcers of diabetes is much more common in patients with predisposing risk factors; the annual prevalence rates in neuropathic individuals vary between 6% and 8%. More than 5% of diabetic patients have a history of foot ulcers, and the cumulative lifetime incidence is likely to reach 15%. We present this study to demonstrate the final results of patients with an emergency or optional diabetic foot ulcer within a year.

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MATERIALS AND METHODS:

In this study, all patients with diabetic foot ulcers of four and fifth grade were included in the study. The severity of ulcers was classified according to Wagner Classification (11) (Table 1).

Table 1: *Wagner11 classification of diabetic foot ulcers*

Grades	Discription
Grade 0	No ulcer in a high risk foot.
Grade 1	Superficial ulcer involving the full skin thickness but not underlying tissues.
Grade 2	Deep ulcer, penetrating down to ligaments and muscle, but no bone involvement or abscess formation.
Grade 3	Deep ulcer with cellulitis or abscess formation, often with osteomyelitis.
Grade 4	Localized gangrene.
Grade 5	Extensive gangrene involving the whole foot.

A complete history of their disease was made, a complete physical examination was carried out and investigations were conducted. All patients were informed about their urgent need for surgical procedure. Written informed consent was obtained from all patients. Some patients were admitted in emergencies and others were considered as elective. The techniques used for different amputations were based on the amputation level and the condition required. The amputation site was left essentially open or open, depending on how clean or infected the wound was, and then debridement and bandage were performed. The analysis was performed using SPSS version 18.0. The frequency of different diseases causing amputation was recorded.

RESULTS:

There were 53 patients in the study. Male patients were 30 years old and women were 23 years old (Table 2).

Table 2: *Gender of patients*

	Frequency	Percent	Cumulative Percent
Female	23	43.4	43.4
Male	30	56.6	100.0
Total	53	100.0	

The mean age was 58.26 (standard deviation 10.15) (Table 3), while the minimum age was 30 years, more than 80 years.

Table 3: *Statistics of age of patients*

	Age of Patient
N	53
Mean	58.26
Median	60.00
Mode	60
Std. Deviation	10.15
Minimum	30
Maximum	80

According to the Wagner classification, 9 patients were with the 4th class and the 5th in the right side and 28 with the right side (52.8%) amputation and in the 25 patients (47.2%) in the patient group (Table 4).

Table 4: *Side involvement of patients*

	Frequency	Percent	Cumulative Percent
Left	28	52.8	52.8
Right	25	47.2	100.0
Total	53	100.0	

Amputation of 2 toe in 5 (9.4%) patients, two fingers in 1 (1.9%), 3 finger amputation in 1 (1.9%) and amputation in 33 (62.3%) patients. In 1 (1.9%) patient, trans-knee amputation, hip amputation in 9 (17%) patients and hip disarticulation in 1 (1.9%) patient (Table 5).

Table 5: *Different types of amputation*

	Frequency	Percent	Cumulative Percent
Amputation of Big Toe	5	9.4	9.4
Above Knee Amputation	9	17.0	26.4
Amputation of Little Toe	1	1.9	28.3
Amputation of 2 Toe	2	3.8	32.1
Amputation of 3 Toe	1	1.9	34.0
Below knee Amputation	33	62.3	96.2
Hip Disarticulation	1	1.9	98.1
Trans Knee Amputation	1	1.9	100.0
Total	53	100.0	

Three (5.66%) patients had foot amputation, which was re-treated with amputation below the knee. Four (7.54%) patients with knee amputation were treated with amputations above the knee.

DISCUSSION:

Many complications may be related to diabetes. Diabetes changes the vascular system and affects many areas of the body such as eyes, kidneys and feet. Studies have shown that low-level amputations (foot, foot, and ankle) are more common in diabetes than in non-diabetic patients (54.8% vs. 29.9%). Above-knee amputations were less frequent in diabetic patients than in non-diabetic patients (16.8% vs. 38.8%). Other studies show that the rate of amputation calculated by diabetic or total population for diabetics is 15-40 times higher than in non-diabetic individuals. The rate of hospital discharges involving an amputation involving diabetes was between 45% and 63%. Standard treatment for diabetic foot by Wagner classification Prevention grade 0, Antibiotics for Grade I and Good glycemic control, the Grade II require good glycemic control and debridement. The class III requires some sort of amputation. In grade 4, extensive debridement and amputation are in the fifth degree, while the preferred treatment is below the knee amputation. Muqim et al. studied more than 100 diabetic foot ulcers and Wagner grades were from zero to five. The rate of incidence of males to females was 62% in males, 38% in females with ratio 3: 2. Women were 23 (43.4%) in grade four diabetic foot. Forty-eight (48%) patients required amputation, 32 patients had Toe / Rye amputation, 5 patients had rays amputation, and 11 patients had amputation under the knee. In this study, 25 (25%) patients with 4 or 5 ulcers were present. In this study, all amputated patients were in the 4th or 5th grade. Green et al., 121 patients with diabetic ulcer 4 or higher, all patients had amputation type. 26 of 121 patients underwent amputation again.

CONCLUSION:

The final results of a prospective study of diabetic foot ulcers indicate that the outcome is associated with longer duration of diabetes and poorer glycemic control. Non-traumatic diabetic ulcers and lower extremity amputations are costly and an important issue for patients, government and health care systems. Research is needed to address the factors that cause amputation, such as ulcer healing, treatment and relapse.

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