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FREQUENCY, CLINICAL PRESENTATION AND MANAGEMENT OF DIABETIC FOOT:

(THE MULTI-INSTITUTIONAL STUDY)

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Abstract:

OBJECTIVE: *To determine the frequency, clinical presentation and management of diabetic foot at tertiary care hospitals*

PATIENTS AND METHODS: *This multi-institutional one year study descriptive case series was conducted on diabetic population had foot complications at Liaquat University Hospital & Govt Lyari general hospital Karachi. The inclusion criteria of the study were all the patients, ≥12 years of age, either gender with diabetes mellitus (type 1 or type 2) presented with foot ulcers, infection and gangrene of foot. The conservative management includes strict glycemic control, meticulous dressing and if needed approach for major surgical interventions. The data was recorded on pre-designed proforma while analyzed in SPSS 16. The frequency, percentages and mean ±SD calculated for study variables.*

RESULTS: *During one year study period total seventy two patients of diabetic foot were enrolled and evaluated. The mean age ±SD for whole population was 52.85±8.93 while the mean ±SD for hemoglobin A1C, fasting and random blood sugar was 9.52±2.84, 169±7.74 and 276.92±8.96 respectively. Thirty subjects had a history of trauma before the onset of foot lesion and majority (75%) were belonged to rural populated areas and had history of diabetes for more than five years (77.7%). The common pathogen identified was staphylococcus aureus 38 (52.8%) and common procedures were slough excision and regular dressing 26 (36.1%) and split skin graft 14 (19.4%).*

CONCLUSION: *Commonest presenting lesion was ulcer, cellulitis and Gangrene. Conservative treatment consists of control of diabetes along with antibiotics while the surgical interventions are other mode of treatment.*

Keywords: *Diabetes mellitus, Foot ulcer and Diabetic foot*

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INTRODUCTION:

The diabetic foot ulcer is a worldwide problem and major complications of diabetes mellitus [1]. Majority of the victims required long term management including amputations [2,3]. Diabetes associated foot disorders remains most frequent cause of diabetes specific hospitalizations [4]. Each year 5% of diabetic patients acquire foot ulcer while around 15% of diabetics develop some foot issues during their illness [5].Former studies had shown that Type 1 diabetic foot complications are also common causes for amputations [6,7]. In the Jain AKC, et al [6] all major amputations performed had history of type 1 diabetes and foot complications with prevalence ranges from 8.89% to 13.39% [6,7]. The etio-pathogenesis of diabetic foot lesion is variable; diabetic vasculopathy, neuropathies, uncontrolled diabetes and infections are few of them [8-11]. The reasons for involvement of foot in diabetic population because of the expose part of body for injury and infections usually neglected by patient while neuropathy and vasculopathy site is also the foot [12,13]. The complications are more likely among poor population due to illiteracy, poverty and negligence [14]. The reason for conducting the present study and evaluating the diabetes in detail because it affects younger age to elderly subjects leads to significant burden in their life style; it is commonest systemic diseases in the society so the complication should be known at community level and also to prevent the complications, the longstanding uncontrolled diabetes leads to vascular and neurological changes which play key role in foot ulcerations, infectious, deformities, systemic complications and amputations. Thus the early and appropriate effective measures can save the diabetic individuals to acquire various complications.

PATIENTS AND METHODS:

This one year descriptive case series was conducted on diabetic population had foot complications at Liaquat University Hospital Hyd / Jamshoro & Govt: Lyari general hospital Karachi. The inclusion criteria of the study were all the patients, ≥12 years of age, either gender had diabetes mellitus (type 1 or type 2) for ≥3 years presented with foot ulcers, infection and gangrene of foot while the exclusion criteria were patients with foot infections without diabetes, subjects with vasculitis , immune-compromised and non cooperative individuals. The informed consent and detail history was taken, specific clinical examination was performed, and routine and relevant investigations were advised. The conservative management includes strict glycemic control, meticulous dressing (care of foot) and if needed approached for surgical interventions. The data was recorded on pre-designed proforma while analyzed in SPSS 16. The frequency, percentages and mean ±SD calculated for study variables.

RESULTS:

Total seventy two patients of diabetic foot were enrolled and evaluated during study period. The mean age ±SD for whole population was 52.85±8.93 while the mean ±SD for hemoglobin A1C, fasting and random blood sugar was 9.52±2.84, 169±7.74 and 276.92±8.96 respectively. Thirty subjects had a history of trauma before the onset of foot lesion and majority (75%) were belonged to rural populated areas. The results of the study are shown in Table 1-5.

Table 1: The Age and Gender Distribution

		GENDER		Total
	AGE (yrs)	Male	Female	
	12-19	2	1	3
		3.9%	4.8%	4.2%
	20-29	4	2	6
		7.8%	9.5%	8.3%
	30-39	12	0	12
		23.5%	.0%	16.7%
	40-49	8	7	15
		15.7%	33.3%	20.8%
	50-59	13	9	22
		25.5%	42.9%	30.6%
	60+	12	2	14
		23.5%	9.5%	19.4%
Total		51	21	72
		100.0%	100.0%	100.0%

Table 2: The Gender and Clinical Presentation

		GENDER		Total
PRESENTATION		Male	Female	
	Ulcer	24	10	34
		47.1%	47.6%	47.2%
	Gangrene	7	6	13
		13.7%	28.6%	18.1%
	Abscess	8	2	10
		15.7%	9.5%	13.9%
	Cellulitis	12	3	15
		23.5%	14.3%	20.8%
Total		51	21	72
		100.0%	100.0%	100.0%

Table 3: The Gender and Duration of Diabetes Mellitus

		DURATION (yrs)		Total
GENDER		≤5 years	> 5	
	Male	12	39	51
		75.0%	69.6%	70.8%
	Female	4	17	21
		25.0%	30.4%	29.2%
Total		16	56	72
		100.0%	100.0%	100.0%

Table 4: The Gender In Relation To Culture and Sensitivity

		GENDER		Total
CULTURE & SENSITIVITY		Male	Female	
	Staphylococcus aureus	23	15	38
		45.1%	71.4%	52.8%
	Pseudomonas aeruginosa	9	1	10
		17.6%	4.8%	13.9%
	Klebsiella	13	2	15
		25.5%	9.5%	20.8%
	Coliform	4	2	6
		7.8%	9.5%	8.3%
	Proteus	2	1	3
		3.9%	4.8%	4.2%
Total		51	21	72
		100.0%	100.0%	100.0%

Table 5: The Gender and Surgical Interventions

		Gender		Total
	TREATMENT	Male	Female	
	Slough excision and regular dressing	16	10	26
		31.4%	47.6%	36.1%
	Split skin graft	11	3	14
		21.6%	14.3%	19.4%
	Fasciotomy	10	1	11
		19.6%	4.8%	15.3%
	Disarticulation	6	2	8
		11.8%	9.5%	11.1%
	Transmetatarsal amputation	4	0	4
		7.8%	.0%	5.6%
	Below knee amputation	2	2	4
		3.9%	9.5%	5.6%
	Above knee amputation	2	3	5
		3.9%	14.3%	6.9%
Total		51	21	72
		100.0%	100.0%	100.0%

DISCUSSION:

The present study had 72 diabetic individuals (both type 1 and 2) and when compared to Jain AKC [15] and Shahbazian H, et al[16] no age group difference was reported. In current study 51 (70.8%) were males and 21 (29.1%) were female cases. The incidence is more in males might be because of house holders of the family and outdoor working routine that creates risk for trauma and sequelae. The observation is consistent with the study by Dinh T, et al [17]. The thirty individuals in this series had a history of trauma before the onset of foot lesion, the findings was also detected by study published in 2004 [18]. The commonest pathophysiological alterations responsible for diabetic foot are neuropathy, ischaemia and infection. Majority of individuals (59 patients) had > 5 years duration of diabetes. Few cases were diagnosed as diabetics following admission and investigations. The neuropathy changes were observed in 25 subjects while the Ischemic complication was detected in 12 individuals whereas the infective complication of foot observed in all patients. The observation was also identified formerly by Lipsky BA, et al [19]. The commonest organism cultured was staphylococcus aureus 38 (58.2%) cases, followed by klebsiella 15(20.8%) and were sensitive to antibiotics as gentamycin, ampicillin, cloxacillin, amikacin, ciproflaxacin and cephalosporin, etc. The role of antibiotics in diabetic foot infections were also discussed by Edmonds M, et al and Abbas M, et al [20,21]. In current study, 26 (36.1%) cases were treated by slough excision, 14(19.4%) with skin graft, 8(11.1%) by disarticulation of single or multiple toes, fasciotomy 11 (15.4%), below knee amputation was done in 4 (5.6%) and above knee amputation were done in 5(6.9%) subjects. The surgical intervention s were also reported by Setacci C, et al and Armstrong DG, et al respectively [22,23]. Proper control of diabetes and foot care is very important in diabetic foot management. Fasting and random blood sugar estimations should be under control with annual ophthalmologist and nephrologist visit [24].Infection should be treated with broad spectrum antibiotics and pentoxyphylline was should also considered in ischemic lesions [25,26]. In present series the amputation rate is lower compared to former literature [27,28]. Might be due to, better glycaemic control, patient education regarding diet and foot care, antibiotics usage, extensive debridement along with regular dressing. In current series after amputation, wound had good healing process and the subjects were referred to rehabilitation centers for prosthesis.

CONCLUSION:

This study comprised of 72 subjects with diabetic foot patients with emphasis on surgical management with predominance of male population. Commonest presenting lesion was ulcer, cellulitis and Gangrene. Conservative treatment consisting of control of diabetes along with antibiotics, wound debridement slough excision followed by dressing resulting in healing process while split skin grafts, transmetatarsal amputation, disarticulation,

amputation below and above knee were the other modes of treatment.

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