



CLINICAL STUDY OF DIABETIC FOOT

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KEYWORDS :

INTRODUCTION

Peripheral neuropathy is among the most common complication of diabetes, affecting more than 25% of the patients with diabetes and can also occur in subjects with impaired glucose tolerance. They include a heterogeneous group of neuropathies affecting sensory, motor and autonomic nerves and present with a range of clinical manifestation which can lead to pain, foot ulceration and amputation. Many patients are asymptomatic and a neurological deficit may be determined only during a routine neurological exam.

Diabetic peripheral neuropathy has been identified as a key element in the causal pathway to foot ulceration and other lower-extremity complications, impaired quality of life and increased mortality. Neuropathy really sets the stage as a single most frequent cause for diabetic foot complications in India. Clinical and sub clinical neuropathy is present in India upto 37%. It is generally believed that 75-90% of patients with foot lesions have neuropathy in India and 10-15% have vasculopathy. There would be some who have neuroischaemic foot as well. It is apparent that foot care problems in diabetic practice are substantial, costly, disabling and associated with high mortality. In view of the above we decided to study the mode of presentation and the number of patients requiring surgical interventions.

AIMS AND OBJECTIVES

The clinical study of diabetic foot is undertaken to assess

The various presentations of diabetic foot like ulceration, resistant deep infections, severe ischemia leading onto gangrene. To study percentage of surgical intervention like debridement, minor/major amputations.

METHODOLOGY

The study was a prospective Study titled done in the department of general surgery during the time period 2 years 2015-2017 on cases of diabetic patients who visited the from the OPD and IPD

Patients between 30-65 years history of diabetes and diagnosed diabetic on admission with a diabetic foot. A semistructured questionnaire was developed to record the medical history, examination details and investigation reports. Detailed medical history and physical examination was done. For wound culture Wound was cleaned with saline to remove the commensal and the specimen was collected from the edge and sent to the lab where Gram staining was done followed by culture in blood agar, Mac Conkeys agar 24-48 hours later organism was identified by colony morphology, Gram staining and biochemical reactions. Antibiotic sensitivity testing was done for antibiotics commonly used as per the hospital protocol.

RESULTS

TABLE1:TYPE OF LESION

Type of lesion	Frequency	Percentage
Abscess	15	15
Eschar	1	1

Gangrene	9	9
Infective wet gangrene	2	2
Ulcer	73	73
total	100	100

TABLE 2 : AGE DISTRIBUTION

Type of lesion	< 20	21-30	31-40	41-50	51-60	More than 60
Abscess	0	1	3	5	4	6
Eschar	0			1		
Gangrene	0			4	4	1
Infective wet gangrene	0					2
Ulcer	0	1	1	16	31	23
Total	0	2	4	26	39	29

TABLE 3: GENDER DISTRIBUTION

TYPE OF LESION		Frequency
Abscess	F	4
	M	11
	Total	15
Eschar	M	1
Gangrene	F	1
	M	8
	Total	9
Infective wet gangrene	M	2
Ulcer	F	16
	M	57
	Total	73

TABLE 4 : DURATION OF LESION

Duration of lesion	Abscess	Eschar	Gangrene	Infective wet gangrene	Ulcer
Less than one month	12	1	5	2	26
1- 3 months	3	0	4	0	11
More than 3 months	0	1	0	0	36
Total	15	1	9	2	73

TABLE 5: SIDE OF LESION

Side of lesion		Frequency	Percent	percent
Abscess	Left	11	73.3	73.3
	Right	4	26.7	26.7
	Total	15	100	100
Eschar	Right	1	100	100
Gangrene	Left	6	66.7	66.7
	Right	3	33.3	33.3
	Total	9	100	100
Infective wet gangrene	Left	2	100	100
Ulcer	Left	33	45.2	43.8
	Right	40	54.8	54.8
	Total	73	100	100

TABLE 6: SITE OF LESION

Site of lesion	Abscess	Eschar	Gangrene	Infective wet gangrene	Ulcer
Great toe	1	0	1	0	2
Heel	11	0	2	1	31
Leg	2	0	1	1	9
Little toe	1	1	5	0	10
planta	0	0	0	0	1
1st web space	0	0	0	0	1
1st webspace	0	0	0	0	1
Dorsum	0	0	0	0	18
Total	15	1	9	2	73

TABLE 7: MODE OF ONSET

Type of lesion	Mode of onset	Frequency	Percent
Abscess	Spontaneous	10	66.7
	Traumatic	5	33.3
	Total	15	100
Eschar	Spontaneous	1	100
Gangrene	Spontaneous	7	77.8
	Traumatic	2	22.2
	Total	9	100
Infective wet gangrene	Spontaneous	2	100
Ulcer	Spontaneous	46	63
	Traumatic	27	37
	Total	73	100

TABLE 8: DM - DURATION IN YEARS

Dm - duration in years	Abscess	Eschar	Gangrene	Infective wet gangrene	Ulcer
Less than a year	3	0	2	0	17
1-5 years	3		2		4
06 to 10years	6	1	1		3
10-20 years	2		2	1	48
More than 20 years	1		2	1	5

TABLE 9: WAGNER'S CLASS

Type of lesion	Wagner's class	Frequency	Percent
Abscess	1	14	93.3
	4	1	6.7
	Total	15	100
Eschar	1	1	100
Gangrene	4	9	100
Infective wet gangrene	4	2	100
Ulcer	1	64	87.7
	4	9	12.3
	Total	73	100

TABLE 10: CO-MORBIDITIES

	Co-morbidities	Htn	lhd	Ckd
Abscess	-	11	14	12
	+	4	1	3
	Total	15	15	15
Eschar	-	1	1	1
Gangrene	-	4	9	6
	+	5	1	3
	Total	9	1	9
Infective wet gangrene	-			1
	+	2	2	1
Ulcer	-	56	72	58
	+	17	1	15
	Total	73	73	73

TABLE 12: MICROBIAL FLORA

Microbial flora	Abscess	Eschar	Gangrene	Infective wet gangrene	Ulcer
Mono-microbial	14	1	8	1	61
Poly-microbial	1	0	1	1	12
Total	15		9	2	73

TABLE 13: TREATMENT

Type of lesion	Treatment	Frequency	Percent
Abscess	I&D	14	93.3
	Ray amputation	1	6.7
	Total	15	100
Eschar	Escharectomy	1	100
Gangrene	Ray amputation	9	100
Infective wet gangrene	Below knee amputation	2	100
Ulcer	Debridement	73	100

DISCUSSION

“Early intervention in order to prevent potential disaster in the management of Diabetic foot was a great responsibility, but also a great opportunity”

TABLE 14: COMPARISON OF GENDER DISTRIBUTION WITH OTHER STUDIES

Study	Males	Females
Our study	76%	24%
Oswal et al	72%	28%
Sunil Jathanna et al	68%	32%
Sanjeev Singla et al	65%	35%

Table 15: Comparison of Age distribution with other studies

Study	most common age
Our study	51-60 years 39%.
Oswal et al	41-50 years (28 patients, 36%)
Reiber GE et al 1	45-64 years

Table 16: Comparison of side distribution with other studies

Study	most common age
Our study	51-60 years 39%.
Oswal et al	41-50 years (28 patients, 36%)
Sunil jathanna et al	36-45 ,34 %
Reiber GE et al 1	45-64 years

Comparison of Mode of presentation: with other studies

Sanjeev Singla et al showed that the site involvement was as follows toes 16 malleolus ,6 dorsum of foot 8, heel 5, metatarsal joint 9 ,lateral aspect of foot 2,

Oswal et al showed that the site involvement was as follows Heel 19 Ball of great toe 18 Dorsum of foot 15 Inter-digital cleft 13 Lower 1/3rd foot 9 medial malleoli 3 Lateral malleoli 1

Chronic complications

The chronic wounds were associated with longer duration whereas the acute complications were shorter duration .70% had diabetic foot manifestations after 10 years of diabetes mellitus. Oswal No. of Patients <5 years 7 ,5-10 years 11, 10-20 years 39 ,20-30 years 18, >30 years 3. Bansel Out of 103 patients, 56 (54%) were found to be anemic, 78 (76%) had neuropathy, 59 (57%) showed signs of ischemia, 31 (30%) had osteomyelitis.

Microbiologic features of diabetic foot infections

The microbiologic features of diabetic foot infections vary according to the tissue infected. Oswal et al showed that altogether 86 bacteria were isolated from 54 cases. Among 82 bacterial isolates, 54 (63 %) were Gram negative while 32 (37%) were Gram-positive bacteria. Escherichia coli was the most common pathogen isolated followed by Staphylococcus aureus, the other organisms isolated were Proteus mirabilis, Citrobacter sp., Streptococci, Acinetobacter

sp., whereas both Gram-positive and Gram-negative were high in cases with polymicrobial infection.

Jayashree Konar. Bacterial etiology could be identified among 67 cases out of 150 (38%); single organism was isolated in 58 (87%) among which **Pseudomonas aeruginosa** was the commonest (31.34%), followed by **Escherichia coli** (23.8%) and **Staphylococcus aureus** (22.4%). **Enterococcus faecium**, **Proteus vulgaris**, **Klebsiella pneumoniae** were isolated in 2 cases each. Among Polymicrobial cases, **Staphylococcus aureus** along with **Klebsiella oxytoca** were isolated in 4 and in rest 5 cases, **Pseudomonas aeruginosa** along with **Escherichia coli** were isolated. Gram negative (72.36%) isolates significantly outnumbered the Gram positive ones. Out of total 19 isolated **Staphylococcus aureus**, 7 were methicillin resistant (36.84%) but all were sensitive to both Vancomycin and Linezolid. One isolated **Enterococcus faecium** was Vancomycin resistant (**van-A** type),

Citron et al², Mohd Zubair et al⁶ reported **Staphylococcus aureus** as the predominant pathogen, which comprised 57.2%, 28% and 26.2% of their isolates respectively.

M.B Girish et al³ reported that 15% of the MRSA strains were resistant to Ampicillin, Cephalosporins and Gentamicin and that they were sensitive to Amikacin, Vancomycin, Teicoplanin and Linezolid but in our study we have found 36.84% of the isolated **S. aureus** was Methicillin resistant which is higher than reported by other workers whereas in accordance with the findings of Raja NS⁴, vancomycin was effective against MRSA. Vancomycin resistant **Enterococcus faecium** is reported in our study which is dissimilar to the findings of Raja NS.

Pappu K et al⁵, who reported that 76% of the organisms which were isolated were gram negative bacilli, **Pseudomonas** being the predominant pathogen (23%), followed by **Staphylococcus aureus** (21%). Zubair et al⁶ reported **Escherichia coli** (26.6%) and **Pseudomonas aeruginosa** (10.6 %) as the predominant gram negative isolates. In the study of Benwan et al⁷ which was done in Kuwait, they reported that more gram-negative pathogens (51.2%) were isolated than gram-positive pathogens (32.3%) or anaerobes (15.3%).

CONCLUSION

- Majority of the patients belong to age group >55 years and males are predominant
- The duration of Diabetes for most of the patients is at least 5 years
- The most common presentation was an abscess followed by cellulitis and foot ulcers.
- 10% of these patients have undergone complete treatment for diabetic foot in the form of skin grafting at the first admission itself.
- The most contributing factor for morbidity was amputations involving the digits both single and multiple.
- Uncontrolled diabetes as shown by poor glycemic control with elevated glycol haemoglobin reflecting the glycemic control status was directly proportional to the rate of wound healing and severity of the diabetic foot.
- Most chronic wounds had a polymicrobial flora as compared to acute wounds like abscess which had a mono microbial flora in the culture.

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