ORIGINAL RESEARCH PAPER

General Surgery

PREVALENCE AND OUTCOME OF TOENAIL ONYCHOMYCOSIS IN DIABETIC FOOT INFECTION

KEY WORDS: Toenail onychomycosis , diabetic foot

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ABSTRACT

This is a prospective observational study carried out June 2021- December 2022.This is a study of 120 patients regarding toenail onychomycosis in diabetic foot.In this study out of 120 patients, 74 patients were male and maximum patients was in 41-60 years age group,with increasing age is significant related to risk of onychomycosis. In this study highest prevalence was seen in female as compared to male. Out of 120, maximum patients had history of diabetes for 6- 10 years and duration was not significant predictor for onychomycosis . Around 33 patients had poorly controlled diabetes; out of those (8) (25%) patients had onychomycosis present. Out of 120 patients, in 19(15.8%) patients PVD was present and 4(28.57%) patients has onychomycosis present. It was statistically insignificant. Out of 120 patients, in 26(21.66%) patients neuropathy was present and 6(23.07%) patients has onychomycosis present and it was statistically significant. morphology of nail is significant predictor for toenail onychomycosis. surgical intervention is not significantly related to toenail onychomycosis in diabetic foot patient

INTRODUCTION

Diabetes mellitus affects individuals of all ages and in all socio-economic segments of the population. There are an estimated 60 million diabetics worldwide.(1) Diabetes mellitus is an important predisposing condition for cutaneous infections, including onychomycosis.(4)Onychomycosis, a mycotic infection of the nail unit, is caused by three groups of fungi, namely dermatophytes, yeasts, and nondermatophyte molds. Onychomycosis accounts for 18–40%(5,6) of all nail disorders and30% of all cutaneous fungal infections.(5-9)

Nails affected by a fungal infection may become thick and distorted, sometimes with sharp edges. Such nails can result in injury to the surrounding skin and pressure erosion of the nail bed.

Diabetics with compromised circulation in the lower extremities and neuropathy are at increased risk of developing complications from onychomycosis. The abrasions or breaks in the skin may remain unnoticed and fail to heal due to the neurovascular complications of diabetes, and may act as the portals of entry for bacteria, fungi, or other organisms. This may result in serious limb-threatening complications, such as cellulitis, osteomyelitis, thrombophlebitis, and possible amputation of the extremity.(10)

Given the potential for morbidity that may result from fungal infections of the nails, and the lack of any study from India with a progressively increasing population of diabetics,.

METHODS

The study was conducted at Dept. Of Surgery, SSG Hospital & Medical college VADODARA from September 2021 to December 2022.The sample size was 120 . It was Prospective observational study .

The following information was obtained:-Age, gender, racial origin, duration and type of diabetes, list of medications taken by the patientand history of diabetic ulcer, peripheral vasculalopathy and neuropathy

The laboratory parameters was included fasting blood sugar , complete blood count, serum creatinine, proteinuria, triglycerides and cholesterol

- Evaluation of the dorsalis pedis artery and posterior tibial pulses, and testing for peripheral neuropathy was done.
- The severity of onychomycosis was evaluated globally for all toenails as:

1. minimal (< 25% of nail plate and bed involvement),
2. moderate (26–75% diseased nail plate and bed)
3. severe (> 75% nail plate and bed or matrix involvement).

Sample collection :-

After disinfection with a 70% alcohol solution, specimens collect from the distal portion of the great toenail , the underside area of the great toenail and the nail bed were collected by scraping with a sterile scalpel or scoop.The nail samples were placed in sterile petri dishes for transportation to the laboratory.

Microscopy and Culture :-

All of the specimens was be analyzed by direct microscopy. Microscopic examination of samples was performed in a 20% potassium hydroxide solution with 4% dimethyl sulfoxide.

Scales scraped from the nails were analyzed for fungal elements, such as hyphae and blastoconidia, by direct microscopic examination.

Statistical Analysis:-

mean
Chi-square is calculated for categorical values
T value is calculated for continuous variables.
PValue <0.05 is consider significant

Data Analysis:

Collected data was tabulated & analyzed in Microsoft excel worksheet. Prevelence and outcome of toenail onychomycosis in diabetic foot patient observe.

RESULT

- In present study, total 120 patients was selected and mean age of participants was 53.33 year with maximum age was 75 year and minimum age was 26 year. While maximum patient belongs to 41-60 year(63.33%).
- Out of 120 patients, 74(61.67%) patients were male and 46(31.33%) patients were female.
- In present study, out of 120, 82(71.74%) patients were on oral hypoglycaemic drugs, 38(28.26%) Patients were on

insulin.

- Here, out of 120 patients, 4 patients were newly diagnosed, 13 patients had diabetes for less than 5 years, 52 patients had diabetes from 6-10 years, 39 patients had history of diabetes from 11-15 years and 12 patients had diabetes for more than 15 years. Here, out of 120 patients, 3(2.5%) patients had Type I DM and 117 (97.5%) patients had type II DM
- In this study of total 120 patient, 36(30%) patients had Previous history of diabetic foot ulcer and 84 (70%) patients had no Previous history of diabetic foot ulcer.
- Here, out of 120 patients, 87(72.5%) patients had good controlled DM on admission and 33 (27.5%) patients had poor controlled DM.
- Here, out of 120 patients, In 19(15.83%) patients had PVD present and 101(84.16%) patients had PVD absent.
- Here, out of 120 patients, In 26(21.66%) patients neuropathy was present and 94(78.33%) patients neuropathy was absent.
- Here, out of 120 patients, In ,male prevalence was 10.81 % and female prevalence was 13.04% and overall prevalence was 11.87%.
- Here, out of 120 patients, highest prevalence in 61-80 age group seen Which is around 15.62%.

DIABETIC CONTROL ON ADMISSION	ONYCOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
GOOD CONTROLLED	3	3	50	31	87
POOR CONTROLLED	5	3	16	9	33
TOTAL PATIENTS	8	6	66	40	120

Here ,there is significant relationship between diabetic control and onychomycosis

Duration(yr)	ONYCOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
FIRST TIME DETECTED	0	0	3	1	4
< 5 YEAR	0	1	8	4	13
6- 10 YEAR	2	1	28	21	52
11-15 YEAR	5	2	20	12	39
>15 YEAR	1	2	7	2	12
Total	8	6	66	40	120

Odds ratio 0.8081 , P = 0.7114

Here ,there is no significant relationship between duration of diabetic and onychomycosis

Type of DM	ONYCHOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
Type 1	0	0	2	1	3
Type 2	8	6	64	39	117
Total	8	6	66	40	120

Odds ratio 1.0197 P = 0.9899

Here ,there is no significant relationship between category of DM and onychomycosis

DAIBETIC MEDICATION	ONYCHOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
ORAL HYPOGLYCEMIC	5	4	44	29	82
INSULIN	3	2	22	11	38
TOTAL	8	6	66	40	120

ODDS RATIO-1.1806 P- 0.7913

Here ,there is no significant relationship between diabetic medication and onychomycosis

PERIPHERAL VASCULAR DISEASE	ONYCHOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
Yes	3	1	14	1	19
No	6	5	56	35	101
Total	8	6	66	40	120

ODDS RATIO-2.4267 P- 0.1752

Here ,there is no significant relationship between peripheral vascular disease and onychomycosis

PERIPHERAL VASCULAR DISEASE	ONYCHOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
Yes	3	1	14	1	19
No	6	5	56	35	101
Total	8	6	66	40	120

ODDS RATIO-2.4267 P- 0.1752

Here ,there is significant relationship between neuropathy and Onychomycosis

PERIPHERAL VASCULAR DISEASE	ONYCHOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
Yes	3	1	14	1	19
No	6	5	56	35	101
Total	8	6	66	40	120

ODDS RATIO-2.4267 P- 0.1752

Here ,there is no significant relationship between previous history odiabetic ulcer and onychomycosis

PERIPHERAL VASCULAR DISEASE	ONYCHOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
Yes	3	1	14	1	19
No	6	5	56	35	101
Total	8	6	66	40	120

ODDS RATIO-2.4267 P- 0.1752

Here ,there is significant relationship between morphology of nail and onychomycosis

SURGICAL INTERVENTION	ONYCHOMYCOSIS PRESENT		ONYCHOMYCOSIS ABSENT		TOTAL
	MALE	FEMALE	MALE	FEMALE	
I AND D	2	2	26	17	47
DEBRIDEMENT	4	2	34	19	59
AMPUTATION	2	2	6	4	14
TOTAL	8	6	66	40	120

Odds ratio 0.8081 , P = 0.7114

Here,among 14 patiens of onychomycosis ,I&D done in 4 patients, debridement done in 6 patients, amputation done in 4 patients. There is no significant that surgical intervention has association with onychomycosis

CONCLUSION:

1. prevalence of toenail onychomycosis in diabetic foot infection patients is around 12%
2. Age, control of diabetes, neuropathy, nail morphology are significant predictor for toenail onychomycosis in diabetic foot infection patients.
3. sex, type of DM, medication of DM, duration of DM ,peripheral vasculopathy, previous history of diabetic foot infection is not significant predictor for toenail onychomycosis in diabetic patients.
4. surgical intervention had not relation in treatment of toenail onychomycosis in diabetic foot infection patient.

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