



CLINICAL AND EPIDEMIOLOGICAL STUDY OF DERMATOPHYTOSIS

Dermatology

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ABSTRACT

Background: Dermatophytosis is a disease condition characterized by the infection of keratinized tissues such as the epidermis, hair and nails. The present study was designed to determine the prevalence of dermatophytosis and to delineate the risk factor and clinical pattern of dermatophytosis. **Methods:** Patients with suspected dermatophytoses attending the outpatient department were enrolled in the study. A detailed history, clinical examination and sample collection for mycological examinations was done. **Results:** 2009 patients were recruited in the study. 62.4% cases of dermatophytosis were men and 37.6% were women; the ratio of men to women was 1.65: 1. The most commonly affected age group was 31-40 years (%). Tinea corporis et cruris was the most common type observed (43%). Potassium hydroxide positivity was seen in 83.3% samples. Hypertension were observed in 4.9% male patients and 2.8% female were having hypertension. Diabetes was noted in 4.5% male and 4.4% females. Hypothyroidism were noted in 3.4% male and 7% female. **Conclusion:** More emphasis should be given to improving hygiene status and living conditions to reduce the risk of skin infection. As diabetics are more prone, awareness regarding skin infection and its control measures should be created.

KEYWORDS

Dermatophytosis, comorbidity, risk factors, diabetes.

INTRODUCTION

Dermatophytosis is a disease condition characterized by the infection of keratinized tissues such as the epidermis, hair and nails. This condition is caused by a group of closely related filamentous fungi commonly known as dermatophytes. Epidermophyton, microsporium and trichophyton are the genera of dermatophytes implicated in superficial mycoses.¹ The present study was designed to determine the prevalence of dermatophytosis and to delineate the risk factor and clinical pattern of dermatophytosis

MATERIAL & METHODS

Present study was a prospective, observational study conducted in Department of DVL in which 2009 patients were clinically diagnosed with dermatophytosis. From 1st oct 2021 to 30th September 2022 period of 10 months. After approval from ethical committee.

Written informed consent was taken from participants. Detailed history was taken which comprise patient information, occupation, application of any local medications and oral medications, duration of illness and site of involvement. Clinical examination was done in bright lighted room for number of lesions, types, colour, presence of inflammatory margin, morphology etc.²

Patients of above 18 years and of both sexes, attending Dermatology OPD, clinically diagnosed cases of skin, hair and nail infection, were included in the study.

Patients who are not willing to give consent for skin scraping, pregnancy, breast feeding, candidal intertrigo, pityriasis versicolor were excluded.³

Sample Collection

The material was taken from well-defined plaque for detection of the fungus elements, identification of the material has been carried out using potassium hydroxide (KOH).⁴

Infected site after cleaning with 70% alcohol, samples were collected by scraping the lesion from the center to the edge, crossing the lesion margin with a sterile 15 no. scalpel blade, nail infection if present, were scrapped and clipped of the infected part included in the sample.⁷

Hair specimen was collected by plucking with epilating forceps along with the base of the hair shaft around the follicle.⁸

Sample Processing

Examination of direct KOH mount: Scrapings of skin, nails and Hair

follicles, mounted on a glass slide were treated with 10% KOH for 10 minutes, and examined under microscope for the presence of fungi under low power (40X) of magnification.

Nail clippings were immersed in 20% KOH overnight and examined next morning. KOH wet mount was screened for the presence of filamentous septate, branched hyphae, arthrospores.⁹

RESULT

Out of the total 2009 patients of dermatophytosis evaluated, 1253 (62.4%) were men, and 756 (37.6%) were women; the ratio of men to women was 1.65: 1. The age of the youngest patient was 18 year, and of the oldest one was 81 years. In this study, dermatophytosis incidence has been seen in the age group from 18 to 20 years old - 5.5%, they are followed by groups of 21-30 years (20.7%), 31-40 years (27.4%), 41-50 years (24.7%), 51-60 years (13.6%), 61-70 years (6.4%). On the basis of occupation there were highest no of homemaker 544 (27.1%), followed by peoples of govt job 411 (20.5%), then Pvt job 371 (18.5%), students 261 (13.0%), self-employed 192 (9.6%).

People of urban area were reported more i.e., 1028 (51.2%) as compared to rural area people i.e., 961 (48.8%). Patients presented with chief complaint of red itchy lesion were 1156 (57.5%), Dark coloured circular lesion were 778 (38.7%), Nail changes 73 (3.6%), Scalp seen in 2 patients (0.1%). Most Patients presented to OPD within 30 days of development of complaint were 1200 (59.7), 1-6 month were 713 (35.5), 1-2 years were 96 (4.8%).

On the basis of prior medication taken from other sources there were 822 patients who had taken oral medication (40.2), topical application done by 398 patients (19.8) and 789 (39.3%) were fresh cases reported to OPD. Out of 2009, In total 1882 (93.7) similar family history was present, absent in 127 (6.3%) patients. (Table 1)

Skin scraping test was positive in 1673 (83.3%) patients and negative in 336 (16.7%). (Figure 1)

For Correlation of Comorbidity with age, out of 2009 patients, 1741 patients of different age groups were not having any comorbidities. Hypertension were observed in 83 patients most were in age group 41-50 years, Diabetes in 89 patients belonging to age group 41-50 years and hypothyroidism in 96 patients maximum were in the age group 21-30 years.

For Correlation of Comorbidity with sex, out of 2009 patients, 1253 were males in which 1092 had not have any Comorbidity and 756 were

female, 649 were not having any comorbidities. Hypertension were observed in 62 male patients i.e., 4.9%, and 21 females were having hypertension i.e., 2.8%. Diabetes was noted in 56 male ie.4.5% and 33 females i.e., 4.4%. Hypothyroidism were noted in 43 males i.e., 3.4% and 53 females i.e., 7%. (Table 2)

For Dermatological comorbidities: Patient with age <30yrs and having history of Atopic dermatitis were more commonly infected with fungal infection (10.80%) which is probably attributed to defective barrier function. Persistent and recurrent infection was reported in these patients. Few patients with atopy and urticaria, mostly in male got more infected with fungal infection. So, in our study a significantly higher prevalence of dermatophyte infection was reported in diabetic and atopic patients. Diabetes affected a significant number of populations from 3rd – 6th decade. Higher rate of dermatophytic infection was found in that group. Although cases of dermatophytic infection were also reported in hypertensive and hypothyroid patients. However, no sex predilection was noticed with equal prevalence in male and female patients. For occupation, patient with diabetes and in govt. job working people (5.60%), housewives (5.10%) and others not specified (6.10%) were reported to be infected in significantly higher number. People of urban area with diabetes were also affected significantly. A higher number of dermatophytic infection among hypertensive and hypothyroidism patient residing in rural areas was also observed. (Table 3)

Skin Scraping test

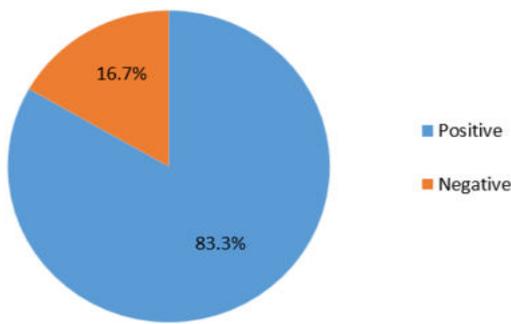


Figure 1. Incidence of positive and Negative skin scraping test

Table 1. Prevalence of Dermatophytosis in relation to demographic variables

Variables	Categories	Frequency (N=2009)	Percentage
Age	Less than 20 years	111	5.5
	21-30 years	415	20.7
	31-40 years	550	27.4
	41-50 years	497	42.7
	51-60 years	274	13.6
	61-70 years	128	6.4
	More than 70 years	34	1.7
Sex	Male	1253	62.4
	Female	756	37.6
Occupation	Student	261	13.8
	Homemaker	544	27.1
	Pvt job	371	18.5
	Govt job	411	20.5
	Self employed	192	9.6
Resident	Urban	1028	51.2
	Rural	981	48.8
Chief complaint	Red itchy lesions	1156	57.5
	Dark coloured lesion	778	38.7
	Nail changes	73	3.6
	Scalp changes	2	0.1
Duration	<30 Days	1200	59.7
	1-6 months	713	35.5
	1-2 years	96	4.8
Diagnosis	Tinea capitis	4	0.2
	Tinea faciei	453	22.55
	Tinea corporis	868	43.2
	Tinea cruris	642	31.96
	Nail onychomycosis	32	1.59

History of prior medication taken	NA	789	39.3
	Topical	398	19.8
	Oral	822	40.2
Co-morbidities	Nil	1741	86.7
	Hypertension	83	4.1
	Diabetes	89	4.4
	Hypothyroidism	96	4.8
Dermatological co-morbidities	Nil	1912	95.2
	Atopic dermatitis	66	3.3
	Urticaria	31	1.5
Family history	Absent	127	6.3
	Present	1882	93.7

Table 2. Correlation of comorbidity with demographic variables

Variables	Categories	Co-morbidity								P-value*
		Nil		Hypertension		Diabetes		Hypothyroidism		
		n	%	n	%	n	%	n	%	
Age	Less than 20 years	98	88.30%	4	3.60%	5	4.50%	4	3.60%	0.001
	21-30 years	375	90.40%	7	1.70%	4	1.00%	29	7.00%	
	31-40 years	482	87.60%	24	4.40%	22	4.00%	22	4.00%	
	41-50 years	418	84.10%	28	5.60%	33	6.60%	18	3.60%	
	51-60 years	235	85.80%	12	4.40%	11	4.00%	16	5.80%	
	61-70 years	103	80.50%	8	6.20%	12	9.40%	5	3.90%	
	More than 70 years	30	88.20%	0	0.00%	2	5.90%	2	5.90%	
	Sex	Male	1092	87.20%	62	4.90%	56	4.50%	43	
Female		649	85.80%	21	2.80%	33	4.40%	53	7.00%	
Occupation	Student	237	90.80%	9	3.40%	6	2.30%	9	3.40%	0.001
	Homemaker	463	85.10%	14	2.60%	28	5.10%	39	7.20%	
	Pvt job	320	86.30%	23	6.20%	11	3.00%	17	4.60%	
	Govt job	343	83.50%	23	5.60%	27	6.60%	18	4.40%	
	Self employed	175	91.10%	5	2.60%	3	1.60%	9	4.70%	
	Other	203	88.30%	9	3.90%	14	6.10%	4	1.70%	
Resident	Urban	906	88.10%	26	2.50%	54	5.30%	42	4.10%	0.001
	Rural	835	85.10%	57	5.80%	35	3.60%	54	5.50%	

*Chi-square test applied for association between these two variables

Table 3. Correlation of dermatological comorbidity with demographic variables

Variables	Categories	Dermatological co-morbidity						P-value*
		Nil		Atopic dermatitis		Urticaria		
		n	%	n	%	n	%	
Age	Less than 20 years	99	89.20%	12	10.80%	0	0.00%	0.001
	21-30 years	395	95.20%	13	3.10%	7	1.70%	
	31-40 years	530	96.40%	10	1.80%	10	1.80%	
	41-50 years	470	94.60%	15	3.00%	12	2.40%	
	51-60 years	265	96.70%	9	3.30%	0	0.00%	
	61-70 years	121	94.50%	7	5.50%	0	0.00%	
	More than 70 years	32	94.10%	0	0.00%	2	5.90%	
	Sex	Male	1188	94.80%	44	3.50%	21	
Female		724	95.80%	22	2.90%	10	1.30%	
Occupation	Student	241	92.30%	17	6.50%	3	1.10%	0.001
	Homemaker	523	96.10%	9	1.70%	12	2.20%	
	Pvt job	342	92.20%	20	5.40%	9	2.40%	
	Govt job	394	95.90%	14	3.40%	3	0.70%	
	Self employed	184	95.80%	4	2.10%	4	2.10%	
Resident	Urban	975	94.80%	37	3.60%	16	1.60%	0.72
	Rural	937	95.50%	29	3.00%	15	1.50%	



Tinea unguium



Tinea pedis



Tinea corporis



Tinea corporis



Tinea faciei

Figure 2. Clinical presentation of Dermatophytosis

DISCUSSION

Our study included 2009 cases of 18-70 years age groups, and we found peak incidence of dermatophytoses was seen in the third decade of life.⁸ Majority (32.2%) of the patients belonged to the age group of 31-40 years, followed by 41-50 years and 21 to 30 years. There was male predominance (62.4 %) in the study patients and the overall male to female ratio was 1.65:1 which has also been observed in other studies.^{5,7,9-11} Male predominance could be due to more outdoor physical activities and excessive heat; high relative humidity and tight-fitting clothing are correlated with an increased opportunity for infections. Men go to the hospital more often than women.

The study of occupational profile of the patients showed that housewives are at high risk due to prolonged soaking of hands and feet in water increases the risk of tinea pedis, and tinea unguium.

Students also make up a sizable portion, perhaps due to changing fashion trends and the growing popularity of skin-tight jeans among young people.¹²

The proportion of fungal infection in urban area (51.2 %) was more preponderant in comparison to rural areas (48.8 %).

In our study, the most common chief complaint amongst the patient was red itchy lesions (57.5%), followed by dark coloured circular lesion (38.7%), nail changes in (3.6%) and scalp changes in (0.1%). The incidence in India's general population has been reported to range from 0.5 to 5% by various workers. Due to higher socioeconomic objectives and health concerns for other diseases in under developed nations, onychomycosis is less well known by both medical professionals and the general public. Onychomycosis persists and spreads despite better personal hygiene practices and living conditions.¹³

The most common site of infection reported in the present study was the trunk which is in corroboration with other studies, followed by lower limb, followed by intertriginous areas. The most prevalent type among the fungal infections is tinea corporis (43.2 %) in this study, which was also found by Das *et al.*¹⁴

Out of the (822/2009) 40.9% patients had used topical corticosteroids either alone or in combination with antibacterial and antifungal agents (e.g., Panderm, Betnovate, Parasmani, Ringuard and Itchguard) for varying periods of time before presentation. Similar finding was found in study done by Pathania S *et al.*¹⁵

Frequent sharing of towels, shoes, and clothing among patients was observed. This can contribute to the spread of infection. Items such as clothing, bedding, and towels can harbor fungal pathogens and spread disease among family members.

Family members of 1882 (93.7%) patients had dermatophytosis, the spouse being frequently affected.¹⁵

Out of 2009 patients, 1253 were males in which 1092 had not have any Comorbidity and 756 were female, 649 were not having any comorbidities. Hypertension were observed in 62 male patients i.e. 4.9%, and 21 females were having hypertension i.e. 2.8%. Diabetes was noted in 56 male i.e.4.5% and 33 females i.e., 4.4%. Hypothyroidism were noted in 43 males i.e., 3.4% and 53 females i.e., 7%.

Direct microscopic examination of specimens was positive in 1673 cases (83.3%), much higher than the positive rate reported in other studies (64-79%) done by Hanumanthappa H *et al.*¹⁶ and Bindu V *et al.*¹⁷

CONCLUSION

More emphasis should be given to improving hygiene status and living conditions to reduce the risk of skin infection. As diabetics are more prone, awareness regarding skin infection and its control measures should be created.

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Declaration Of Patient Consent

The authors certify that they have obtained all appropriate patient consent.

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