International Journal of Community Medicine and Public Health
Chopra P et al. Int J Community Med Public Health. 2023 Jul;10(7):2441-2446
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20232034

Original Research Article

KAP survey in patients of dermatophytosis in a tertiary care hospital: a cross-sectional study

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Received: 02 May 2023
Accepted: 31 May 2023

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ABSTRACT

Background: Dermatophytes are a group of fungi with the capacity to invade keratinized tissue. Along with etiological factors, the clinical and epidemiological patterns has shown changing trend, leading to epidemic state of dermatophytosis. This could be attributed to inadequate knowledge and substandard practices followed by patients of dermatophytosis.
Methods: A cross-sectional observational survey of patients with dermatophytosis who visited the outpatient department of dermatology at a tertiary healthcare facility over a period of two months to assess knowledge, attitude and practices regarding dermatophytosis management was performed.
Results: A total of two hundred and twenty-seven (227) patients were recruited in during 2-month study period. The male:female ratio was 0.82:1. Fifty two percent respondents were from a rural background. Fifteen percent of respondents had cattles as pets. Majority of the respondents preferred wearing loose clothes (79%), 89% wore cotton as the material of cloth and 35% preferred wearing closed footwear. Seventy two percent were unaware of the infective nature of disease and 84% of the treatment of this condition 11.45% were hesitant to take oral treatment for the same. More than half of the patients gave a history of self-medication, and 27% of the patients gave a history of receiving steroid injections.
Conclusions: This study concluded that there is an extensive knowledge gap in this subset of the population, which lead to faulty and substandard practices, such as self-treating, steroid abuse and visiting quacks before considering registered dermatologists for treatment purposes.

Keywords: Dermatophytosis, KAP survey, KOH, Quackery, Steroid abuse, Tinea

INTRODUCTION

Dermatophytes are a group of closely related fungi that have the capacity to invade keratinized tissue (skin, hair, and nails) of humans and other animals to produce an infection, dermatophytosis, commonly referred to as ringworm.[1] They belong to three different genera epidermophyton (E), microsporum (M) and trichophyton (T). These dermatophytes reproduce asexually, hence are also known as fungi imperfecti.[2] The prevalence of various clinical types of dermatophytic infections varies among different age groups, for instance, school going children are more commonly affected as tinea capitis followed by tinea corporis and then tinea pedis.[3] However, there has been a recent change in etiology of dermatophytic infections, where *T. schoenleinii*, *M. audouinii*, *E. floccosum* and *M. ferrugineum*, were highly popular earlier, but are now disappearing from most countries and are becoming limited to some less-developed countries. Also, zoophilic dermatophytes like *M. canis* causing inflammatory Tinea are increasingly being isolated from human hosts due to petting popularization.[4] Along with etiological factors, the clinical and epidemiological patterns of dermatophytic infections have also shown a changing trend, which has led to an epidemic state of this infection, especially in

tropical countries like India. Furthermore, there is gradual increase in frequency of yeast and yeast-like organism causing skin infections in tropical and subtropical countries.[4]

The changed face of dermatophytosis is believed to be due to an interplay between host, fungus, drugs and environment. It is attributable to multiple factors, namely; more humid and warmer climate, absurd use of topical corticosteroid-based combinations, altered clothing patterns and unhygienic personal habits. There is also an increasing number of atypical presentations, like tinea pseudo-imbricata, tinea incognito (steroid modified tinea), erythrodermic variants of tinea corporis, and an increasing number of patients having tinea faciei. These presentations have been implicated to be due to topical corticosteroids misuse and their subsequent adverse reactions. The result of this has been evident by the observation that many patients with chronic, recurrent and widespread lesions respond minimally to standard dose and duration of antifungal therapy.[5] It is, thus, posing diagnostic as well as therapeutic challenge to clinicians and dermatologists, to identify varied presentations of tinea infections and their subsequent management. This change can be attributed to inadequate knowledge and substandard practices, practiced by people living with dermatophytosis, and hence requires in depth knowledge of such exercises, in order to combat them at community level.

Aims and objectives

To assess the knowledge and attitude of patients about etiology, transmission and treatment options for dermatophytosis. To assess practices used in the patient community to manage dermatophytosis.

METHODS

This was a cross-sectional observational survey of patients who visited the outpatient department of dermatology at a tertiary healthcare facility in Punjab in over a period of 2 months (August 2022 to September 2022). The study was conducted after the approval of the ethics committee of the hospital (EC/NEW/INST/2020/997/20319). A total of 227 patients who visited the outpatient department during the study duration were included. On obtaining written informed consent at the initial visit, the study subjects were asked for a detailed history along with demographic details. A complete dermatological examination was performed to outline the morphology of the skin lesion, sites involved according to prestructured proforma and questionnaire. A KOH examination (if required) was carried out to diagnose dermatophytic infection in patients with altered morphology and difficult to diagnose cases. All the patients presenting with annular scaly lesions with well-defined papulovesicular margin and central clearing and patients with altered morphology but with positive KOH mount were included in the study. However, patients having other concurrent dermatological diseases were excluded. The data was analysed in Microsoft excel sheet. The numerical data was expressed as mean and categorical data was expressed as number (%).

RESULTS

Two hundred and twenty-seven (227) patients attending the outpatient department of dermatology of a tertiary healthcare facility from August 2022 to September 2022 were administered the questionnaire and fill the responses. There were 131/227 (58%) females and 96/227 (42%) males. The age of respondents ranged from 8-68 years with a mean age of 35.49 years. Most patients belonged to the age group of 18-28 years (28.2%) (Table 1).

Table 1: Demographic characteristics of study subjects.

	N (%)
Gender distribution of study subjects	
Males	96 (42)
Females	131 (58)
Age distribution of study subjects (in years)	
8-28	13 (5.7)
18-28	64 (28.2)
28-38	59 (25.9)
38-48	56 (26.4)
48-58	19 (8.3)
58-68	16 (7)
Demographic background	
Rural	119 (52)
Urban	108 (48)

One hundred and ninety (52%) respondents were from a rural background whereas 108/227 (48%) were from an urban background. Majority of the respondents (93.4%) reported to the OPD with the chief complaint of itching and the mean duration of symptoms was 10.04 months.

Figure 1: Clinical presentation of dermatophytosis in study population.

Various atypical presentations of dermatophytosis; A) bullous type of tinea pedis; B) T. incognito without characteristic central clearing; C) Tinea barbae; D) Bizarre patterns of steroid

modified tinea corporis; E) Tinea faciei; F) inflammatory type of tinea.

Two-third patients (67%) had a gradual onset whereas the rest came with a complaint of acute onset (33%) of the infection. On inquiring about the presence of dermatophytic infections in any member of the family, 101/227 (44.45%) responded affirmatively while more than half had no family history of such infections. The most commonly involved site of lesion was the groin followed by the trunk and the legs while the beard region was involved in only 2 individuals (Figure 1).

Table 2: Distribution of patient according to the clinical type of dermatophytic infection.

Clinical type	Number of patients (%)
T. corporis	120 (53)
T. cruris	44 (19.3)
T. unguium	20 (8.8)
T. pedis	17 (7.5)
T. incognito	11 (4.8)
T. capitis	8 (3.5)
T. mannum	5 (2.2)
T. barbae	2 (0.8)

Table 3: Personal habits of study subjects.

	Number of patients (%)
Type of clothes	
Loose	179 (79)
Tight	48 (21)
Material of clothes	
Cotton	202 (89)
Synthetic	23 (10)
Cotton, woollen, synthetic	2 (1)
Type of footwear	
Open	145 (64)
Closed	79 (35)
Both	3 (1)

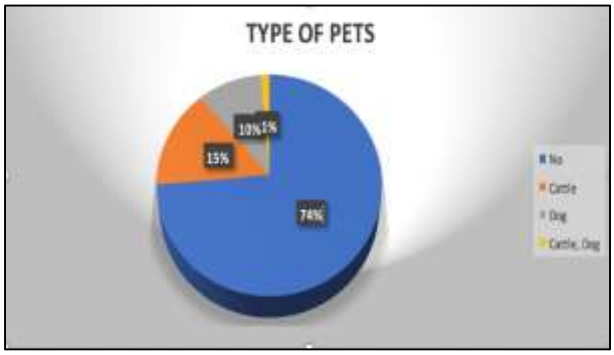

Figure 2: Petting population of study subjects.

Fifty three percent of respondents were diagnosed with tinea corporis followed by tinea cruris in 19.3% and tinea unguium in 8.8%. Approximately, 5% (11/227) of the respondents were diagnosed as tinea incognito (Table 2). Fifteen percent of respondents had cattle as pets followed by 10% who petted dogs (Figure 2). Almost all respondents took baths daily (93.8%) and had a habit of changing clothes daily (98.7%). Majority of the respondents preferred wearing loose clothes (79%) and cotton as the material of cloth (89%) on a daily basis. Sixty four percent of respondents preferred wearing open footwear followed by 35% who preferred wearing closed footwear on a daily basis (Table 3).

More than half respondents (72%) believed that dermatophytosis is an allergic condition while 190/227 (84%) had no knowledge of the treatment for the same. When asked about their hesitancy to oral treatment only 26/227 (11.45%) replied that they were hesitant to take any oral medication for a skin condition (Table 4). More than half of the patients (66.8%) had no knowledge about the spread of dermatophytosis, followed by 22% patients who thought it actually spread through sharing of clothes. A third of the patients refuted the belief of spread of the infection by sexual contact (Table 4).

Table 4: Knowledge of study subjects.

	Number of respondents (%) (N=227)	
	Yes	**No**
Is it an allergic condition?	163 (72)	64 (28)
Knowledge about treatment	37 (16)	190 (84)
Hesitant to oral treatment	26 (11.45)	201 (88.54)
Spread of infection by sexual contact	57 (25)	170 (75)

Table 5: Response of patients to practices practised for the dermatophytic infections.

	Number of respondents (%) (N=227)	
	Yes	**No**
History of application of combination creams	160 (70)	67 (30)
History of injectable to steroids	61 (27)	166 (73)
History of practising indigenous methods before seeking medical treatment	31 (14)	196 (86)
History of visit to local unregistered practitioner	147 (65)	80 (35)
Compliance to treatment	100 (44.05)	127 (55.95)

More than half of the patients gave a history of self-medication by applying combination creams before visiting the healthcare facility. While 27% of the patients gave a history of getting steroid injections. History of using indigenous practices before seeking medical treatment was present in 14% of the respondents. More than half of the patients (65%) had a history of visiting a

local unregistered practitioner before consulting a registered dermatologist (Table 5).

Figure 3: Response of patients when asked about relief from indigenous practices.

Majority of the patients 183/227 (80.6%) did not experience any relief with the use of indigenous medical practices and/or home-made remedies. 13.2% of patients experienced only temporary relief from such practices (Figure 3). Compliance to treatment was seen only in 100/227 (44.05%) of patients.

DISCUSSION

Dermatophytosis is a superficial fungal infection of skin, hair and nails. Chronic dermatophytosis refers to patients who has suffered from the disease for more than 6 months to 1 year of duration and recurrent dermatophytosis refers to recurrence of dermatophytic infection within few weeks after completion of treatment.[6] In a recent review of published literature from India, authors have reported to foresee the unprecedented epidemic like scenario of dermatophytosis in India, showing a rising trend of both incidence and prevalence of dermatophytosis along with presence of recurrent and relapsing infections, all over the country in last 5-7 years.[7]

Clinico-epidemiological profile

The distribution of patients according to gender is almost equal, with 58% patients being females and 42% were males, corresponding to male:female ratio of 0.82:1. This is consistent with the results of study done by Pataro et al on 294 patients in 2019 i.e. 0.88:1.[8] The age range of subjects is 8-68 years in current study and mean age was 35.49 years, which is comparable to studies done by Pathania et al and Rudramuthy et al in 2018.[9,10] In this study, 48% patients were from urban background and 52% were from rural background, making the proportion of distribution of dermatophytosis in both populations almost equal. The mean duration of disease was 10.04 months, with 2/3rd of patients responding to have gradual onset. Forty four percent patients also have positive family history and mostly patients (93.4%) complained of itching as the primary presenting complaint.

The most common site involved in this study is groin, followed by trunk, legs and gluteal region; and least commonly involved site is beard. Facial lesions were present in 20 patients (8.8%), corresponding to 4.8% of incognito type of tinea. Dutta et al in 2019 also reported face to be the most common site to be involved in tinea incognito.[11]

The most common clinical type in this study cohort was tinea corporis (53%), followed by tinea cruris (19.3%) and least common was tinea barbae (0.8%). A study by Lakshmanan et al in 2015 and other by Poudyal and Joshi in 2016; also reported tinea corporis to be the most common.[12,13] However, Saha et al, reported Tinea corporis et cruris (41.4%) to be most common type of tinea infection in his study, followed by tinea corporis (34.2) and tinea cruris (27.9%).[14]

Knowledge

In this study, 72% of patients responded that they do not know the infective nature of this disease and believed that it is an allergic reaction to some external factor. Eighty four percent of subjects did not know the treatment of this condition and 11.45% were even hesitant to take oral treatment for a condition which just itches. On enquiring about spread, 66.8% responded that they don't know the mode of spread while 2.2%, 3.5% and 1.3% of subjects also made comments about spread of dermatophytosis through cement, water and seasonal change respectively. Sixty nine percent patients i.e. almost two third of patients believed that dermatophytosis can spread through sexual contact too. To the best of our knowledge, there is no study in English literature to find these knowledge gaps about dermatophytosis and its spread.

Attitude

The questionnaire and subsequent statistical analysis revealed that most patients have a mitigating attitude towards cumbent and epidemic spread of dermatophytosis, as there were only 3 patients who responded negatively, when asked about whether they change their clothes daily or not. Similarly, only 6.2% of the population responded to having missed baths sometimes during their daily routines, while maximum proportion of subjects took bath regularly. Petting is a menace to dermatophytic epidemic as evident from previous studies, but in our study only 26% population had pets at home or in vicinity of their habitat, which include mostly cattles and dogs.[15,16] There is also role of clothing pattern and laundry habits on risk of acquiring and persistence of dermatophytic infection.[17,18] In our study, 21% patients responded that they prefer wearing tight clothing and 11% prefer wearing more synthetic and woollens, making themselves more prone to acquiring infection. Similarly incidence of tinea pedis also rises by preference of wearing closed footwear, which 35% of our study subjects also preferred.[19]

Practices

In this study, 70% of study subjects have a history of applied steroid and antifungal combination creams; 5% have applied on their own and 65% of subjects visited local unregistered medical practitioners and quacks; before visiting the dermatology outpatient department. Many studies previously had also highlighted the role of application of topical steroids in patients of dermatophytosis (Table 6), leading to atypical presentations and appearance of chronic, recurrent and resistant to treatment lesions. Out of all, 27% patients have also got injectable steroids to alleviate symptoms quickly. Dutta and colleagues; in their study in 2017 had reported that topical betamethasone is the most common steroid compound which is being dispensed to tinea patients.[11] Fourteen patients have also applied indigenous substances before visiting the dermatologist, which in this study is mustard oil and fuller's earth as medicinal clay. However, Polat reported cologne, saltwater, vinegar and henna as common applicants in his study population.[20] But most of the patients (80%), experienced no relief after application of these substances in this study.

The last observation was about compliance to treatment, and this study found that more than half of patients (55.94%) were non-compliant to treatment and came irregularly for follow-ups. This was also reported by Pathania in 2018 and Saha in 2021, who observed that this leads to recurrent and chronic dermatophytosis in their study subjects (9.3% and 34.2%, respectively).[9,14]

Table 6: Application of topical steroids by patients of dermatophytosis as reported in various studies across english literature

Studies in literature	Percentage of patients who have applied steroid antifungal combination creams
Present study	70%
Polat et al[14]	55.9%
Saha et al[16]	49.5%
Yahya et al[11]	100%
Mahajan et al[28]	70%
Poudyal and Joshi[9]	30.1%

The emphasis of current literature on education and knowledge about infectious diseases is of as utmost importance as is the importance of them being timely and rightly treated before their spread to others. This was also highlighted by Polat et al in 2019 who reported that education and knowledge have significant correlation with presence and absence of tinea pedis in their study subjects.[20] Similarly, Farida et al, also saw an increase of disease alleviating attitude and practices from 38% to 67% after counselling and targeted education of the affected population.[21]

Limitation of this study is that it does not correlate the educational, and socioeconomic status of study subjects with their knowledge, attitude and practices regarding dermatophytic infection spread and further puts forward the next research question in this area.

CONCLUSION

This study concludes that there is an extensive knowledge gap in this subset of the population, which lead to faulty and substandard practices, such as self-treating and visiting quacks before considering registered dermatologists for treatment purposes. This whole scenario of poor knowledge about spread, self-treatment, non-compliance, increased petting, unhygienic lifestyle and urbanised clothing patterns can lead to a peril stage of dermatophytic infections and thus, jeopardize the health of the entire community as a whole. Addressing these knowledge gaps and making an effort towards correcting the attitude of patients could help in better management of this contagious infection.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee vide no: EC/NEW/INST/2020/997/20319

REFERENCES

1. Summerbell IW. The dermatophytes. Clin Microbiol Rev. 1995;8:240-59.
2. Rashidian S, Falahati M, Kordbacheh P, Mahmoudi M, Safara M, Tafti HS, et al. A study on etiologic agents and clinical manifestations of dermatophytosis in Yazd, Iran. Curr Med Mycol. 2015;1(4):20.
3. Adefemi SA, Odeigah LO, Alabi KM. Prevalence of dermatophytosis among primary school children in Oke-Oyi community of Kwara state. Niger J Clin Pract. 2011;14(1).
4. Zhan P, Liu W. The changing face of dermatophytic infections worldwide. Mycopathologia. 2017;182(1-2):77-86.
5. Verma S, Madhu R. The great Indian epidemic of superficial dermatophytosis: an appraisal. Indian J Dermatol. 2017;62(3):227.
6. Dogra S, Uprety S. The menace of chronic and recurrent dermatophytosis in India: is the problem deeper than we perceive? Indian Dermatol Online J. 2016;7(2):73.
7. Verma SB, Panda S, Nenoff P, Singal A, Rudramurthy SM, Uhrlass S, et al. The unprecedented epidemic-like scenario of dermatophytosis in India: I. Epidemiology, risk factors and clinical features. Indian J Dermatol Venereol Leprol. 2021;87(2):154-75.
8. Patro N, Panda M, Jena A. The menace of superficial dermatophytosis on the quality of life of patients attending referral hospital in eastern India: a

cross-sectional observational study. Indian Dermatol Online J. 2019;10(3):262.
9. Pathania S, Rudramurthy SM, Narang T, Saikia UN, Dogra S. A prospective study of the epidemiological and clinical patterns of recurrent dermatophytosis at a tertiary care hospital in India. Indian J Dermatol Venereol Leprol. 2018;84(6):678-84.
10. Rudramurthy SM, Shankarnarayan SA, Dogra S, Shaw D, Mushtaq K, Paul RA, et al. Mutation in the squalene epoxidase gene of trichophyton interdigitale and trichophyton rubrum associated with allylamine resistance. Antimicrob Agents Chemother. 2018;62(5).
11. Dutta B, Rasul ES, Boro B. Clinico-epidemiological study of tinea incognito with microbiological correlation. Indian J Dermatol Venereol Leprol. 2017;83(3):326-31.
12. Lakshmanan A, Ganeshkumar P, Raam Mohan S, Hemamalini M, Madhavan R. Epidemiological and clinical pattern of dermatomycoses in rural India. Indian J Med Microbiol. 2015;33:S134-6.
13. Poudyal Y, Joshi SD. Medication Practice of Patients with Dermatophytosis. JNMA J Nepal Med Assoc. 2016;55(203):7-10.
14. Saha I, Podder I, Chowdhury S, Bhattacharya S. Clinico-mycological profile of treatment-naïve, chronic, recurrent and steroid-modified dermatophytosis at a tertiary care centre in eastern India: an institution-based cross-sectional study. Indian Dermatol Online J. 2021;12(5):714.
15. Debnath C, Mitra T, Kumar A, Samanta I. Detection of dermatophytes in healthy companion dogs and cats in eastern India. Iran J Vet Res. 2016;17(1):20.
16. Paryuni AD, Indarjulianto S, Widyarini S. Dermatophytosis in companion animals: a review. Vet World. 2020;13(6):1174.
17. Ossowski B, Duchmann U. Effect of domestic laundry processes on mycotic contamination of textiles. Hautarzt Zeitschrift Dermatol Venerol Verwandte Gebiete. 1997;48(6):397-401.
18. Hammer TR, Mucha H, Hoefer D. Infection risk by dermatophytes during storage and after domestic laundry and their temperature-dependent inactivation. Mycopathologia. 2011;171(1):43-9.
19. Nigam PK, Saleh D. Tinea Pedis. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2023.
20. Kara Polat A, Akın Belli A, Göre Karaali M, Koku Aksu AE. The attitudes, behaviors, and opinions about non-pharmacological agents in patients with tinea pedis. Dermatol Ther. 2020;33(6):e14041.
21. Farida F. Effect of health counselling on tinea pedis on farmers attitudes in prevention of Tinea Pedis in Sukodono village, Karangrejo district, Tulungagung regency, 2017. J Glob Res Public Health. 2019;4(1):75-7.

Cite this article as: Chopra P, Aulakh S, Goel S, Chopra D. KAP survey in patients of dermatophytosis in a tertiary care hospital: a cross-sectional study. Int J Community Med Public Health 2023;10:2441-6.