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Impact of socio-economic status on dermatophytosis in a north Indian hospital

Juwairia Ashraf[1], Tabassum Latafat[1], M Mohsin[2], Mohd Aslam[3], Muhammad Uwais Ashraf[3*]

[1]Department of Moalajat, Ajmal Khan Tibbiya College, AMU, Aligarh-202002, UP, India.
[2]Department of Amraz-e-Jild wa Zohrawiya, Ajmal Khan Tibbiya College, AMU, Aligarh-202002, UP, India.
[3]Department of Medicine, JN Medical College, AMU, Aligarh-202002, UP, India.

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*Author for correspondence
E-mail: uwaisashraf@gmail.com
Mobile/Tel: +91 9760159391

ABSTRACT

Background: Socioeconomic status plays an important role in the prevalence of dermatophytosis (Tinea). The present study was therefore designed to find out its impact in Aligarh (UP, India).

Subject and methods: A total of 207 patients with suspected dermatophytosis were screened and 126 (60.87%) patients having fungal hyphae in potassium hydroxide (KOH) smear were selected for the study. Patients were divided into five groups according to Kuppuswamy's socio-economic status scale (2007).

Results: It was found that the majority of patients belonged to upper lower socio-economic status, followed by lower middle, upper middle, upper and lower socio-economic status. Recurrence was found in 33 patients. History of anthropophilic contact was found in 31 patients. History of zoophilic contact was found in 46 patients.

Conclusion: The study suggests that group 4 may be main human reservoir of dermatophyte infection in Aligarh (UP, India).

Key words: Socio-economic status, Dermatophytosis, Tinea.

INTRODUCTION

Dermatophytosis or tinea is the superficial fungal infection caused by keratophilic fungi known as dermatophytes that have predilection for skin, hair and nails. Dermatophytes belong to three genera (*Trichophyton*, *Microsporum* and *Epidermophyton*). Dermatophytosis remains to be a general public health problem (Emmons et al., 1997; Rippon, 1982; Venugopal et al., 1993). Overpopulation and poor hygienic conditions along with high rate of humidity favor the growth of dermatophytes. These conditions are usually common among the individuals of low socio-economic status. Although, there are many studies across India and the world, but very little data of the said disease from our region have been reported so far. Hence, it was planned to study the effect of socio-economic status on dermatophytosis in the district Aligarh, UP, India.

SUBJECT AND METHODS

This was an open-label, hospital based study, conducted at Ajmal Khan Tibbiya College Hospital, Aligarh Muslim University, Aligarh, UP, India. The study was commenced after it was passed from Institutional Ethics Committee (IEC). During the study period (January 2010 to December 2012), 207 patients were screened and only those with positive potassium hydroxide (KOH) smear were included in the study. Other inclusion criteria were patients of either sex and clinically diagnosed patients of dermatophytosis [patients presenting with lesions associated with itching, erythema, scaling and eruptions (papules/vesicles)]. Patients suffering from concomitant disease and patients with secondarily infected lesions were excluded from the study. Out of all the patients screened, only 126 patients had fungal hyphae in KOH smear. Therefore, assessment was carried out for 126 patients. Detailed history of the patients was recorded and the patients were classified into five groups on the basis of kuppuswamy socio-economic status scale (modified for 2007).

Skin scraping was done and the samples were examined under the microscope after treating with potassium hydroxide (KOH). Before collecting the sample, the patients were explained about the procedure and informed consent was taken. Skin scraping was done by the edge of a slide and the material obtained was kept

over another slide. Then 2 drops of KOH (potassium hydroxide) were added and a cover slip was placed over it. Cover slip was gently tapped by a blunt object to crush the scales. The smear was then allowed to stand for about 15-20 minutes. It was then examined under the microscope. In case of tinea capitis, affected hair was also plucked along with scraping. In case of tinea unguium nail clippings were taken along with sub-ungual debris and the smear was allowed to stand over-night.

Statistical analysis

All data are mentioned as rates and frequencies along with percentages. Data are compared using *Omnibus test*. The significance of frequencies within different socio-economic groups is compared using the *Wald Chi Square test*. A p-value of < 0.05 has been taken as significant.

RESULTS

According to Kuppuswamy socio-economic status scale (modified for 2007) majority of patients belonged to upper lower group which comprised of 50 (39.68%) patients. It was followed by lower middle and upper middle group consisting of 34 (26.98%) and 33 (26.19%) patients respectively. Upper and lower groups shared equal incidence with 5 (3.97%) patients in each group. History of recurrent infections was positive in 33 (26.19%) patients (Table 3). As far as socio-economic status is concerned, majority of them (15 patients) were from upper lower socio-economic status. Next to this, recurrent infections were found in upper middle class (12 patients), followed by lower middle (5 patients) and lower (1 patient) class. None of the patients in upper group had positive history of recurrent infection. History of anthropophilic contact was found in 31 (24.60%) patients as depicted in table 2. Distribution of patients according to anthropophilic contact is shown in table 4 and out of 31, maximum number of patients i.e., 12 (9.52%) belonged to upper lower socio-economic status, followed by 11 (8.73%) in lower middle, 8 (6.35%) in upper middle and only 1 (0.79%) in lower class. None of the patients in upper class had positive history of anthropophilic contact. History of contact with animals was found in 46 (36.51%) patients (Table 2). Out of all, 23 (18.25%) patients were from upper lower class, followed by 9 (7.14%) patients in upper middle and lower middle class, 3 (2.38%) patients were from lower class and 2 (1.59%) from upper class.

Table 1. Distribution of patients according to socio-economic status.

S. No.	Socioeconomic status	No.	%
1	Upper (I)	5	3.97
2	Upper Middle (II)	33	26.19
3	Lower Middle (III)	34	26.98
4	Upper Lower (IV)	50	39.68
5	Lower (V)	5	3.97
p-value	0.001		

Table 2. Distribution of patients according to contact.

S. No.	History of contact	No.	%
1	Anthropophilic	31	24.60
2	Zoophilic	46	36.51
p-value	< 0.001		

Table 3. Relationship of socio-economic status with recurrent infection.

S. No.	Socioeconomic status	Recurrent infection (No.)
1	Upper (I)	0
2	Upper Middle (II)	12
3	Lower Middle (III)	5
4	Upper Lower (IV)	15
5	Lower (V)	1
p-value	0.013	

Table 4. Relationship of socio-economic status to anthropophilic contact.

S. No.	Socioeconomic Status	Anthropophilic contact (No.)
1	Upper (I)	0
2	Upper Middle (II)	8
3	Lower Middle (III)	11
4	Upper Lower (IV)	11
5	Lower (V)	1
p-value	0.004	

Table 5. Distribution of Patients according to contact with animals.

S. No.	Socioeconomic Status	Contact with animals (No.)
1	Upper (I)	2
2	Upper Middle (II)	9
3	Lower Middle (III)	9
4	Upper Lower (IV)	23
5	Lower (V)	3
p-value	0.006	

DISCUSSION

Dermatophytosis in a population may reflect the climatic condition, customs, hygiene and socio-economic status of people (Attapattu, 1982). Therefore its study plays a vital role. Table 1 shows that the maximum number of patients i.e., 50 (39.6%) belonged to upper lower class. This indicates that dermatophytosis is closely related to socio-economic status. This finding is in accidence with the finding of Bassiri-Jahromi, et al. (2009). According to a yet another study by Ranganathan, et al. (1995), dermatophytosis was found to be the most common in very low and low socio-economic status. Similar findings were reported in Kuwait (Karaoui R et al., 1979). Studies

in Delhi have shown that about 68% of patients belong to overcrowded areas with low socioeconomic and unhygienic status (Kumari et al., 1985; Sehgal et al., 1985). It may probably be due to improper maintenance of principles of personal hygiene, as is the case with such individuals. Another reason behind this may be the living condition, large family size, and close contact, either directly or by sharing facilities, including combs and towels which are common between family members in these individuals. History of recurrent infection was found to be positive in 33 (26.2%) patients. Out of which maximum i.e., 15 patients were from upper lower socio-economic status. Another study has reported recurrence of this disease in 32% of patients (Bindu et al., 2002). Recurrence could be due to inadequate treatment or due to lack of immunity. If the treatment is stopped before all the fungi are shed, then the disease will re-establish (Bindu et al., 2002). Fungal infections therefore require prolonged treatment depending upon the site of infection. Patients of lower socio-economic status do not usually approach qualified physicians and stop the treatment once they get symptomatic relief. Also, most of them could not afford the treatment expenses. Lack of immunity is also one of the risk factors and it also creates problem in combating the infection. Most of these subjects are malnourished. Low protein diet has also been reported to be linked with increased occurrence of dermatophytosis (Kanwar et al., 2008). History of anthropophilic contact was found in 31 (24.6%) patients. This corroborates well with the study by Bindu et al (Bindu et al., 2002). Majority of them i.e., 11 (8.73%) were from upper lower and lower middle class. This could be due to the fact that the habit of sharing facilities is common among such individuals. 36.51% patients in the present study had a positive history of contact with animals. Out of all, 23 (18.25%) patients were from upper lower class, followed by 9 (7.14%) patients in upper middle and lower middle class, 3 (2.38%) patients were from lower class and 2 (1.59%) from upper class. Positivity may be due to the zoophilic nature of the disease. Domestic animals and pets are becoming an increasing source of these infections in urban areas (Aly, 1994). In group 1, that is, the upper class the commonest type of tinea infection encountered was tinea cruris. This could be due to the occlusive clothing habits of such individuals which hampers proper aeration of the groin and provides moist environment for the dermatophytes to grow easily. In rest of the groups studied, tinea corporis was found to be the commonest type of dermatophytosis.

CONCLUSION

From the current study it can be concluded that socio-ecinimic status is closely related to dermatophytosis. Following kuppuswamy socio-economic scale, group 4 (upper lower) showed highest occurrence of dermatophytosis in this region. Recurrent infection was also commonest among the individuals of this group. Also, the history of anthropophilic and zoophilic contact was common in the same group.

CONFLICT OF INTEREST

None declared.

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