



Prevalence and Socio-economic Correlation of Dermatophytes Isolated from Clinical Samples in a Tertiary Care Centre in South India

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ABSTRACT: Dermatophytes are by far the most significant fungi because of their widespread involvement of population at large and their prevalence all over the world, particularly in the tropical and subtropical countries like India. The present study was undertaken to determine the social & demographic factors including occupational correlation of various dermatophytic infections. Skin, nail and hair specimens taken from a total of one hundred and five clinically diagnosed randomly selected patients of dermatophytosis attending the outpatient department of Dermatology and Venereology, HSK Hospital and Research Centre, Bagalkot, North Karnataka, India. Patient data was collected using a pre-structured and pre-tested proforma which included age, sex, socio-economic status, Region (rural or urban), occupation, etc. The social, demographic & occupational factors were then correlated with the clinic-mycological diagnosis of dermatophytosis. Dermatophytosis was more common in the age group of 31-40 years (27.6%) and in males (70.48%). Most of the patients belonged to low socio-economic status (51.43%) and of rural region. Fungi were demonstrated in 74 cases (70.48%) either by KOH and/or culture. Dermatophytosis was more common in manual workers (48.6%). Most common clinical type was tinea corporis (44.8%) followed by tinea cruris (18.09%). Most common aetiological agent was *T. rubrum* (51.35%).

Keywords: Dermatophytosis; Tinea corporis; Tinea cruris; Tinea unguium and Trichophyton rubrum..

INTRODUCTION: Superficial cutaneous fungal infections are commonly encountered fungal diseases prevalent in most parts of the world. The dermatophytes are by far the most significant cutaneous fungi because of their widespread involvement of population at large and their worldwide prevalence.¹

Dermatophytes are closely related keratinophilic fungi with ability to degrade keratin and invade the skin, hair and nails, thus causing dermatophytosis (ringworm or tinea).² The classical presentation of tinea infection, is an annular lesion, sharply margined with central clearing and surrounded by an advancing, inflamed, raised border. Dermatophytes are assuming greater significance both in developed and developing countries particularly due to advent of immunosuppressive drugs and disease.⁵ Hot and humid climate in the tropical and subtropical countries like India makes dermatophytosis or ringworm a very common superficial fungal skin infection.^{3,4 & 5}

Species distribution and prevalence varies with the geographical area and during the course of time and is governed by environmental conditions, personal hygiene and individual's susceptibility. The epidemiology of most of the clinically significant

dermatophytosis has substantially changed over the last few years.^{1,6}

Therefore, a study of dermatophytosis in a population is important as it may reflect the climatic condition, customs, hygienic and socio-economic status of the people.⁷

The clinical presentation is very often confused with other skin disorders particularly due to rampant application of broad-spectrum steroid, making laboratory diagnosis and confirmation necessary³ and although it responds to conventional antifungals, dermatophytosis has a tendency to recur at same or different sites.⁸ Hence, a correct diagnosis is important to initiate appropriate treatment and also essential for epidemiological purposes. This study was aimed to determine the socio-demographic pattern of dermatophytosis in the study area.

MATERIAL AND METHODS: A total of one hundred and five clinically diagnosed randomly selected cases of skin, hair and nail infection, of all age groups and of both sexes, attending Dermatology and Venereology outpatient department of HSK Hospital, S. N. Medical College, Bagalkot were taken for the study.

The selected cases were studied using a pre-structured proforma which consisted of a detailed history of selected cases in relation to biodata comprising the name, age, sex, address, region (rural / urban), socio-economic status (Lower/ Middle/ Upper) and occupation along with duration of illness and involvement of more than one site.

Specimen Collection: The affected area was cleaned with 70% ethyl alcohol, skin scales, crusts and pieces of nail or hairs were collected in clean, dry, brown paper packets. Skin specimen was collected by scraping across the inflamed margin of lesion into the apparently healthy tissue. Nail specimen was collected by taking clippings of the infected part and scrapings beneath the nail and hair specimen was collected by plucking with epilating forceps along with the base of the hair shaft around the follicle. Direct Microscopic Examination was performed with potassium-hydroxide (KOH) wet preparation of various concentrations (10%, 20% and 40%) depending on the type of clinical specimen for the presence of fungal elements. Following direct microscopic examination, irrespective of demonstration of fungal elements, Fungal Culture was done by inoculating the specimen onto two sets of test tubes, one containing Sabouraud's dextrose agar with 0.05% chloramphenicol, 0.1% gentamicin and 0.5% cycloheximide, and the other on dermatophyte test medium. Sabouraud's dextrose agar with 0.05% chloramphenicol, 0.1% gentamicin and 0.5% cycloheximide was incubated at 28°C for up to four weeks and observed for any growth. Dermatophyte test medium was incubated at 28°C for up to ten days and was observed for colour change. Fungal isolate was identified based on colony morphology, pigmentation, growth rate, microscopy (LPCB), slide culture, urease test and hair perforation test.

Statistical analysis: Percentages, proportions and appropriate statistical tests was used for data analysis.

RESULTS AND DISCUSSION: A total of 105 cases were distributed between the ranges of 6-78 years. Mean age was 35.64 years. Most common age group affected was 31-40 years with 29 cases (27.61%) followed by 21-30 years with 26 cases (24.76%) and 41-50 years with 18 cases (17.14%). Least common age group affected was >70 years with 1 case (0.95%) followed by 0-10 years with 5 cases (4.76%).

Out of 105 cases, males were more commonly affected with 74 cases (70.48%) than females with 31 cases (29.52%). Male to female ratio was 2.38:1.

Tinea corporis was more common in the age group 31-40 years with 16 cases (34.04%) and in males with

32 cases (68.08%) than females with 15 cases (31.91%). Tinea cruris was more common in the age group 21-30 and 31-40 years each with 7 cases (36.84%) and in males with 18 cases (94.73%). Tinea unguium was more common in the age group of 41-50 years with 5 cases (31.25%) and in males with 11 cases (68.75%). Tinea capitis was more common in the age group of 0-10 years with 5 cases (62.5%) and equally distributed among males and females with 4 cases each.

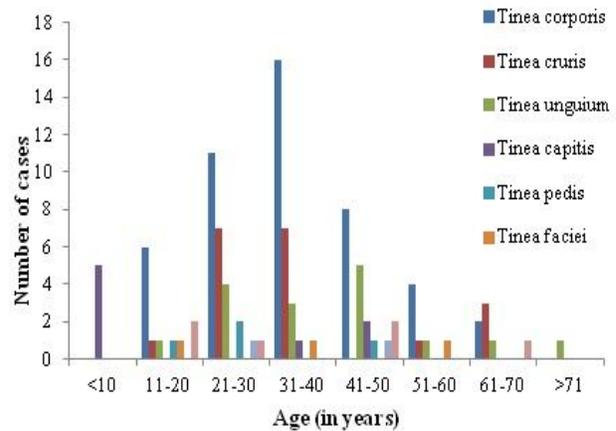


Figure 1: Age distribution in relation to clinical types.

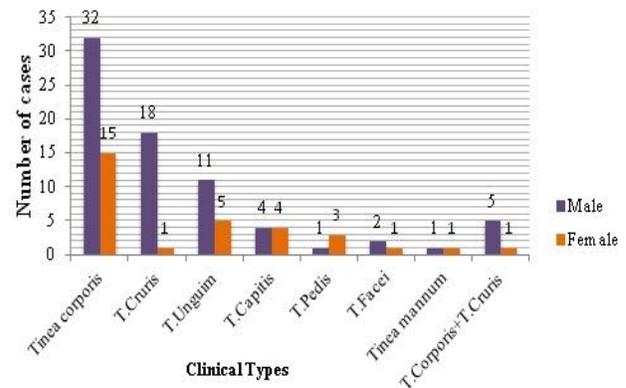


Figure 2: Sex wise distribution in relation to clinical types.

Majority of the cases were from low income group with 54 cases (51.43%) and belonging to the rural region (54%).

Clinical types of dermatophytes isolated and its relation to occupation: Out of 105 cases, most common clinical type was tinea corporis with 47 cases (44.76%) followed by tinea cruris (18.09%), tinea unguium (15.24%), tinea capitis (7.62%), tinea corporis with tinea cruris (5.71%), tinea pedis (3.81%), tinea faciei (3.81%) and tinea manuum (1.9%). Tinea corporis was most commonly seen in manual workers with 24 cases (51.06%) followed by

household workers with 12 cases (25.53%). *Tinea cruris* was most commonly seen in manual workers with 12 cases (63.16%) followed by household workers with 5 cases (26.31%). *Tinea unguium* was more commonly seen in manual workers with 9 cases (56.25%) followed by household workers with 5 cases (31.25%). *Tinea capitis* was more commonly seen in school going children with 5 cases (62.5%). *Tinea pedis* was more common in household workers 2 cases (50%), followed by manual workers and students 1 case each (50%).

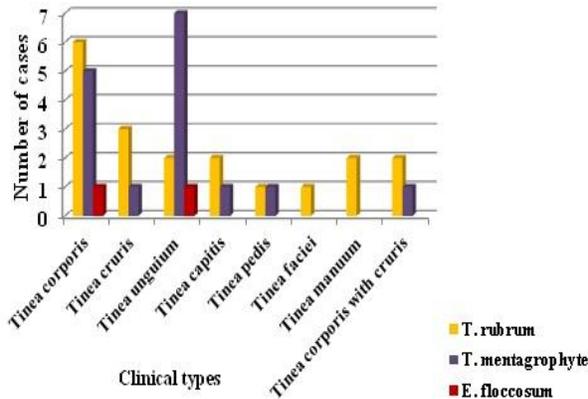


Figure 3: Dermatophytes isolated in relation to clinical types.

Dermatophytosis is the commonest group of superficial fungal infections seen in the tropics where hot and humid climate is conducive for the growth of these fungi. In the present study which was carried out in Bagalkot, a district of North Karnataka, the clinical type and socio-demographic pattern of dermatophytosis was studied along with the species prevalent in this part of the country.

Dermatophytosis was more common in the age group of 31-40 years (27.6%) followed by 21-30 years (24.76%), which is comparable with other studies done by Veer P et al⁹, Jain N et al¹⁰ whereas Sen SS et al⁴, Sahai S et al⁶ and Peerapur BV et al¹¹ reported the most common age group to be 21-30 years. Males (70.48%) were more commonly affected than females (29.52%). Male to female ratio was 2.38:1, which is comparable with previous studies by Siddappa K et al¹², Bindu V et al¹³, Sumana V et al⁵ and Sen SS et al⁴, whereas Bhokari MA et al¹⁴ reported that females were commonly affected than males, with male to female ratio being 1:2.6 and 1:1.08 respectively.

In the present study, *tinea corporis* was the commonest clinical type encountered (44.76%) followed by *tinea cruris* (18.09%) and the commonest age group affected was 31-40 years (34.04%). Males (68.08%) were predominantly affected than females (31.91%). These findings are comparable with studies by Bindu

V¹³ (54.6%), Sen SS⁴ (48%) and Jain Neetu¹⁰ (37%). *Tinea capitis* was more commonly seen in the age group of 0-10 years (62.5%), which is comparable with other studies done by Siddappa K¹² (77.78%) and Kalla G¹⁵ (85.5%). It was seen equally distributed among males (50%) and females (50%) in the present study. A higher incidence in females was reported by Jha NB¹⁶ (65.2%) and Grover Chander¹⁷ (51.4%), whereas Kalla G¹⁵ reported a higher incidence among males (M/F ratio: 1.8:1).

High occurrence of *tinea capitis* in less than 10 years of age may be due to lack of secretion of fungistatic sebum by scalp before puberty. Female preponderance of *tinea capitis* reported by several workers may be due to hormonal changes, closeness to children, more visits to hairdresser, whereas the reported lower incidence in females may be due to the custom of regular application of vegetable oil over the scalp which has fungistatic properties.

Infection was found to be most common in low income group 51.4% followed by middle income group 32.4% and high income group 16.19%, which is similar to the observation of Ranganathan S et al⁷ who reported that 69.2% of infected people were from low income group and 23.2% from middle income group. This may be due to poor hygienic condition, overcrowding, sharing clothes without washing them properly and also due to poor nutrition. Dermatophytosis was most commonly seen in manual workers in the current study, 51 (48.6%), which included agricultural workers and manual labourers, followed by household workers (mainly housewives) 26 (24.8%), students 21 (20%) and other miscellaneous 7 (6.7%) which included professionals, service and business class workers. The above findings are comparable with the observations of Veer P et al⁹ and Sumana V et al⁵. This could be due to increased physical activity and opportunity for exposure in case of manual workers and increased wet work in case of housewives.

The incidence of dermatophytosis in this study was found to be maximum during the months, June to September (35.24%), followed by January and February (30.5%), which is similar to the findings of Kalla G et al¹⁵ and Sumana V⁵ et al. The higher incidence during monsoon, post-monsoon months could be due to increased humidity and moisture. Lower incidence in extreme summer and winter could be attributed to the dry, arid climate during this period of the year.

Tinea rubrum 19 (51.35%) was the commonest aetiological agent in majority of clinical types followed by *T. mentagrophytes* 16 (43.24%), which is comparable to other studies done by Bindu V et al¹³, Ranganathan S et al⁷ and Jain N et al¹⁰.

CONCLUSION: Dermatophyte infections are very common in our country where hot and humid climate in association with poor hygienic conditions play an important role in the growth of these fungi. Prevalence of Dermatophytosis was commonly seen in Males of rural region belonging to low socio-economic class and farmers or manual labourers by occupation. There is varying difference in isolation of different species from southern and northern part of India. By and large Trichophyton species forms the commonest aetiological agent of dermatophytosis.

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