

Original article:

Prevalence of dermatophytosis and its spectrum in a tertiary care hospital, Kolhapur

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Abstract:

Introduction: Dermatophytosis prevalence is variably common in different parts of the India. Climatic conditions in varied states is favourable for dermatophytosis which can lead to irresistible clinical symptoms and if not treated in time infection spreads rapidly.

Aim and objectives: this study was carried out to evaluate prevalence as well as mycological profile of dermatophytosis in clinically suspected cases.

Material and Methods: Total 80 clinically diagnosed cases of dermatophytosis were included for the study. Specimens collected were skin scrapings, nail scrapes or nail clippings and infected hair stubs according to type of ringworm infected. All specimens subjected to standard laboratory techniques i.e. microscopy by KOH mount and simultaneous culture inoculation on special fungal media.

Results: Tinea corporis (41.25%) was the common clinical condition presented in patients of dermatophytosis. KOH (87.50%) found to be simple and effective diagnostic tool in early detection of cases while culture shown positivity in 78.75% cases. Major isolates were dermatophytes(66.25%) and among those *Trichophyton mentagrophytes* (37.74%) was the predominant isolate followed by *Trichophyton tonsurans* (28.30%) and *Trichophyton rubrum* (24.53%).

Conclusion: Taking into account prevalence of dermatophytes, it has been found to be major skin pathogen in Kolhapur. Also this clinical condition is more prevalent in males as compared to females. Farming, poultry and allied occupation which is common occupation in and around Kolhapur may be responsible for development of dermatophytosis. Need to build awareness in population regarding dermatophytoses so as to prevent emergence and spread of disease in future.

Key Words: Dermatophytosis, Dermatophytes, Tinea, Trichophyton

Introduction:

As time evolving Fungal infections has been increasing its prevalence. Among the fungal infections, superficial fungal infections are the most common infections. The worldwide prevalence rate of these infections found to be 20-25%.¹ Dermatophytosis is the most important fungal infections which characterized by involvement of

keratinized tissue. The group of fungi leading to above condition known as dermatophytes.

Dermatophytes are filamentous fungi which commonly infects skin, hair and nails. They are usually restricted to non-living or dead cornified layer of epidermis as they are unable to penetrate living tissue of the host.² Typical infections caused by dermatophytes are popularly known as ringworm

infections. Clinically these infections termed as tinea infections and described according to the site of involvement. These infections usually diagnosed clinically but they can be confused with other skin disorders. Early laboratory diagnosis helps in timely beginning of treatment.³ The present study was conducted to know the prevalence of dermatophyte infections and species prevalent in and around tertiary care hospital, Kolhapur.

Aim and objectives:

- Current study aimed to know the prevalence of dermatophytosis in and around, Kolhapur.
- To evaluate the mycological profile of dermatophytosis.

Material and methods:

This was cross-sectional study undertaken to evaluate the clinico-mycological profile of dermatophyte infection. The specimens were collected over a period of June-2015 to December-2015, from the individuals who visited skin outpatient department, at R.C.S.M. Govt. medical college and C.P.R. hospital, Kolhapur and processed further in department of microbiology for identification.

Specimen collection:

Clinically suspected cases according to clinical type which included skin, hair and nails. Detailed clinical history including age, sex, socioeconomic status, occupation, type of lesion. While collecting specimens strict aseptic precaution were followed, cleaning of the affected sites with 70% ethanol in order to remove environmental contaminants. Skin scrapings were collected from the edges of the skin lesions with the help of sterile scalpel, infected hairs were plucked while nails were clipped and collected in sterile paper envelope. After collection of Specimen, it was divided into two portions for further

processing for microscopic examination and culture inoculation.^{4,5,6}

Direct examination

Skin scrapings subjected to 10% KOH for 10 min, mounted on glass slide and examined under microscope for the presence of any fungal elements followed by inoculation on media for further isolation and identification process. Hair and nails were also processed for same procedure except for direct mount they were processed with 40% KOH for 30 min followed by wet mount on glass slide. KOH softens and clears the material for easier detection of fungal elements by digesting proteinaceous material and keratinous cellular debris.^{4,5,6}

Culture of specimens

Samples were inoculated on Sabouraud's Dextrose Agar (SDA) with chloramphenicol and simultaneously on SDA containing cycloheximide (0.05%) in duplicate set. One set were incubated at room temperature i.e at 25°C to 30°C and one set of media were incubated at 37°C aerobically. All inoculated Culture tubes were examined periodically twice a week for any fungal growth for at least 4 weeks before labeled as sterile. Meanwhile any fungal colony grown, macroscopic characteristics like rate of growth, texture, pigmentation on both obverse and reverse side of growth were noted which can give clue in identification of dermatophytic species. Further identification of mould isolates were performed by lactophenol cotton blue mount which observed by microscopy.

Urease test was used as an adjunct to the microscopic examination for the differentiation of few dermatophyte species. This test helps in differentiation of *Trichophyton tonsurans*, *Trichophyton violaceum*, and *Trichophyton rubrum* which produces urease enzyme.

Dermatophyte species identification was based on mainly characteristic sporulation i.e. on the basis of size, shape and arrangement of microconidia and macroconidia produced by different species. Slide culture were done for confirmation by using Potato Dextrose agar which is a sporulating medium. ^{4,5,6}

Results

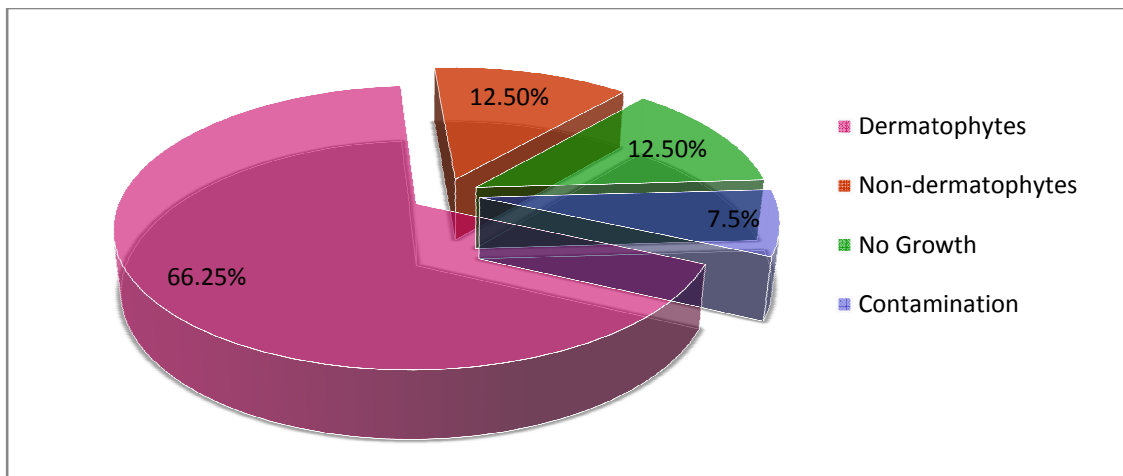
In the current study, total of 80 samples were analyzed. Most of the patients were presented with skin manifestations comprising 48 males and 32 females. 33(41.25%) patients presented with Tinea corporis followed by, Tinea cruris 26(32.50%) and Tinea pedis 14(17.50%).

Table 1: Comparison of microscopy and culture

Microscopy Culture	KOH Positive	KOH Negative	Total
Culture positive	58(72.5%)	5(6.25%)	63
Culture negative	12(15%)	5(6.25%)	17
Total	70	10	80

Out of 80 cases analyzed, direct microscopy i.e KOH was positive in 70 cases(87.50%), while culture grown in 63(78.75%) cases. Both KOH and culture were positive in 58 (72.50%) patients while only KOH positive (fig.1) findings were present in 12 (15%) cases. Dermatophyte were major pathogens grown in isolated cases. Total 53(66.25%) isolates were belonged to dermatophyte species (fig.2) while non-dermatophyte species were grown in only 10(12.50%) cases. Certain cases in which growth was present only in one tube was considered as contamination by environment. Contamination interfered isolation in 6(7.5%) cases.

Graph 1: culture isolation:



Among Dermatophyte isolates, *Trichophyton* and *Microsporum* genera were isolated, none isolates of *Epidermophyton* were grown in present study. Out of total dermatophyte isolates, *Trichophyton mentagrophytes* (37.74%)(fig.3) was the most common isolate followed by *Trichophyton tonsurans* (28.30%) and *Trichophyton rubrum*(fig.4)(24.53%). 2 isolates belonged to *Microsporum spp.* (fig.5) .



Fig. 1: KOH Mount of Skin Scraping



Fig. 2: Cottony white growth of Dermatophyte

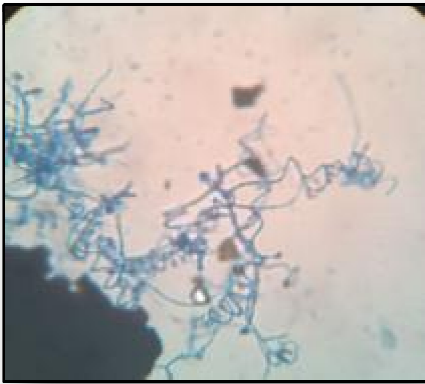


Fig. 3: Spiral Hyphae and chlamydoconidia seen in LPCB mount of *T. mentagrophytes*



Fig. 4: Club shaped microconidia seen in LPCB mount of *T. rubrum*



Fig. 5: Spindle shaped microconidia seen in LPCB mount of *Microsporum cookei*

Discussion:

The present study was conducted to evaluate the prevalence of different species of dermatophytes in different Tinea infections in tertiary care hospital, Kolhapur. As climate of Kolhapur favourable for development of ringworm infections in population. In addition to that occupation is also a common predisposing factor for causation. Here major occupation in and around Kolhapur belongs to farming, animal husbandry and allied occupation. As per evidence Zoophilic dermatophytes also commonly plays role in etiology of dermatophytosis.⁵ In the current study, dermatophytosis was somewhat more prevalent in males (60%) as compared to females (40%). Similar observations noticed in the Kak et al study⁷ and Bhatia et al³ study. This difference may be due to occupational involvement of males in farming and also allied occupation involving exposure to animals. Clinical presentation of dermatophytosis variable and they are typed according to the site of presentation. In present study, Tinea corporis(41.25%) was more common clinical presentation which is in accordance with the Bindu et al⁸ and Mahale et al⁹. Direct microscopy is an important tool in early diagnosis of infection and aids to clinicians in early commencement of effective treatment as dermatophytosis spreads rapidly, requires long term clinical management. Overall positivity by KOH mount (Table 1) was found to be 87.50% cases which was comparable with study by Gupta et al¹⁰ and Bhagra et al¹¹ in which KOH positivity was 85% and 80% respectively. While culture was positive in 72.50% cases, among total isolates dermatophytes prevalence was about 66.25% while rest isolates were non-dermatophytin fungi. This is nearly in agreement with various studies conducted in Indian sub-continent. Study conducted

by Bhagra et al¹¹ noticed culture prevalence of dermatophytes was 68% while while Mahale et al⁹ had 61% prevalence while other studies had variable observations ranging from 30% to 70% in different areas of India.^{7,9,10,12}

Among isolated dermatophytes *T.mentagrophytes* was the most common isolate contributing 37.74%, followed by *T.tonsurans* 28.30% and *T.rubrum* 24.53%. Bhatia et al had similar finding, *T.mentagrophytes* was most common isolate though they found different isolation rate. We observed other isolates also like *T.schonelenii* and *M.cookei* though rate of isolation was very less. We observed in our study that , there was no *Epidermophyton* spp. Grown. Most remarkable observation we had in our study, *T.mentagrophytes* as the most common etiological agent among dermatophytes. This is in contrary to various studies conducted in India, in which *T.rubrum* was the predominant agent commonly involved in etiology of dermatophytosis.^{10,11,12,13, 14}

Conclusion:

Present study highlights that dermatophytosis is a major skin and allied infection in Kolhapur. Most commonly affects males may be due to their involvement in outdoor activities or involved occupational exposure to animals and soil. Need of awareness of hygienic practices and also early reporting to the hospital so as to prevent and trim down spread of infection. Though culture is considered as gold standard for diagnosis, KOH mount is an easy, time saving and imperative tool in early diagnosis as well as effective management of cases. Clinician's awareness of the demographic outline of the population concerned and at the same time need of additional studies on dermatomycoses which can help in understanding the etiological

profile in area so as to effectively curtail its occurrence and cosmetic defacement.

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