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## Distribution and prevalence of dermatophytosis in tertiary care hospital

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### Abstract

**Introduction:** Dermatophytes are a group of closely related fungi that belong to three genera: Microsporum, Trichophyton and Epidermophyton, of more than 40 different species, only a few are common causes of human infection. The natural reservoir of dermatophytes can be humans (anthropophilic), animals (zoophilic), or soil (geophilic). Common species causing human infection include *E. floccosum*, *T. rubrum*, *T. mentagrophytes*, *T. tonsurans* (anthropophilic) and *M. canis* (zoophilic). Infection by dermatophytes usually involves cutaneous nonliving tissue due to the inability of dermatophytes to penetrate the deeper tissues or organs of immunosuppressed hosts. This distribution pattern of dermatophytes infection in different part of the world has been attributed to factors of climate, life-style, and prevalence of immunodeficiency diseases in the community and also the reluctance of patients to seek treatment because of embarrassment or minor nature of disease unless the condition becomes sufficiently serious to affect the quality of life.

**Material and Methods:** Patient's data including age, sex, clinical diagnosis, site of infection and referring clinic were processed, identified and analyzed. All specimens were examined by 10% KOH mount and Lactophenol Cotton Blue for screening of fungal element and inoculated on Sabouraud's Dextrose Agar (SDA) with 0.5% mg/ml Chloramphenicol (with or without 0.5 mg/ml Cycloheximide). Fungus isolates were identified according standard procedures.

**Result:** In our present study we included 100 patients suffering from dermatological disorder of any ages from 2015 to 2016 in tertiary care hospital of Udaipur. Out of 100 patients 45 were males and 55 were females. Among them, 40 patients found to be suffering from dermatophytosis, in which 22 (55%) were male and female were 18 (45%). Organism were isolated from hair, skin and nail samples of patients were *Trichophyton spp* 16 (40%) were most prevalent followed by *Microsporum spp* 15 (37.5%), *Candida spp* 6 (15%), *Epidermophyton spp* 2 (5%) and *Aspergillus spp* 1 (2.5%).

**Conclusion:** The actual prevalence of fungal diseases and their most common causative agents among children and adults in Udaipur are unknown. The causative agents include the dermatophytes, *Candida spp.* and *Aspergillus spp.* So, we need a proper policy in tertiary care hospitals to provide effective treatment as well as prevent the misuse of Antifungal drugs. However further studies with large sample size is highly recommended to further support the findings from this study.

**Keywords:** prevalence, dermatophytosis, tertiary care hospital

### Introduction

Dermatophytes are a group of closely related fungi that belong to three genera: Microsporum, Trichophyton and Epidermophyton, of more than 40 different species, only a few are common causes of human infection. Trichophyton species infect hair, skin, or nails. Microsporum: Microsporum species infect only hair and skin. Epidermophyton: Epidermophyton attacks the skin and nails but not the hair. Dermatophytes are probably restricted to the non-viable skin because most are unable to grow at 37 °C or in the presence of serum. The natural reservoir of dermatophytes can be humans (anthropophilic), animals (zoophilic), or soil (geophilic). Human beings are the main or only hosts for anthropophilic dermatophytes. Anthropophilic species may be transmitted by direct contact or through fomites, such as contaminated towels, clothing, shared shower stalls and similar examples. Examples are *T. rubrum*, *M. audouinii* and *Epidermophyton-floccosum*.-The anthropophilic group tends to cause chronic infections that may be difficult to cure. Zoophilic Species These are natural parasites of animals. Examples are *T. verrucosum* in cattle and *M. canis* in dogs and cats. Human infections with zoophilic dermatophytes cause severe inflammation but are more readily curable.

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**Geophilic Species** They occur naturally in soil, are relatively less pathogenic for human beings. Examples are *M. gypseum* and *T. ajelloi*. The anthropophilic group tends to cause chronic infections that may be difficult to cure. The zoophilic and geophilic dermatophytes tend to cause inflammatory lesions that respond well to therapy and may occasionally heal spontaneously. Common species causing human infection include *E. floccosum*, *T. rubrum*, *T. mentagrophytes*, *T. tonsurans* (anthropophilic) and *M. canis* (zoophilic). These are very common infectious agents found throughout the world, although some other types of dermatophytes are found in restricted geographical areas. They have the capacity to invade the keratinized tissues (the skin, hair, and nail) of humans and other animals to produce an infection called dermatophytosis which is commonly referred to as ring worm <sup>[1, 2]</sup>. Infection by dermatophytes usually involves cutaneous nonliving tissue due to the inability of dermatophytes to penetrate the deeper tissues or organs of immunosuppressed hosts <sup>[3, 4]</sup>. Although dermatophytosis is considered to be a trivial disease, the psychological effects of the disease are highly considerable and because of its high morbidity, it is a costly disease in terms of loss of working days and treatment <sup>[5]</sup>. Worldwide, they are among the most common infectious agents for human and prevalence of infections caused by them has been dramatically rises to such a level in the last decades that skin mycoses now affect more than 20–25% of the world's population, which make them one of the most frequent forms of infections. <sup>[6, 7]</sup> Dermatophytes infect keratinized tissue and digest keratin by the mean of keratinase enzymes <sup>[8]</sup>. They transmitted by direct or indirect contact with lesion of human, clothing, contaminated floors, shower stalls, combs, hair brushes, barber clippers and fomites <sup>[9]</sup>. Variation in the distribution pattern of dermatophytes infection among different countries of the world are evident in the studies of Ayadi *et al.* (1993), Staats and Korstanje (1995), Weitzman *et al.* (1998), Ellabib

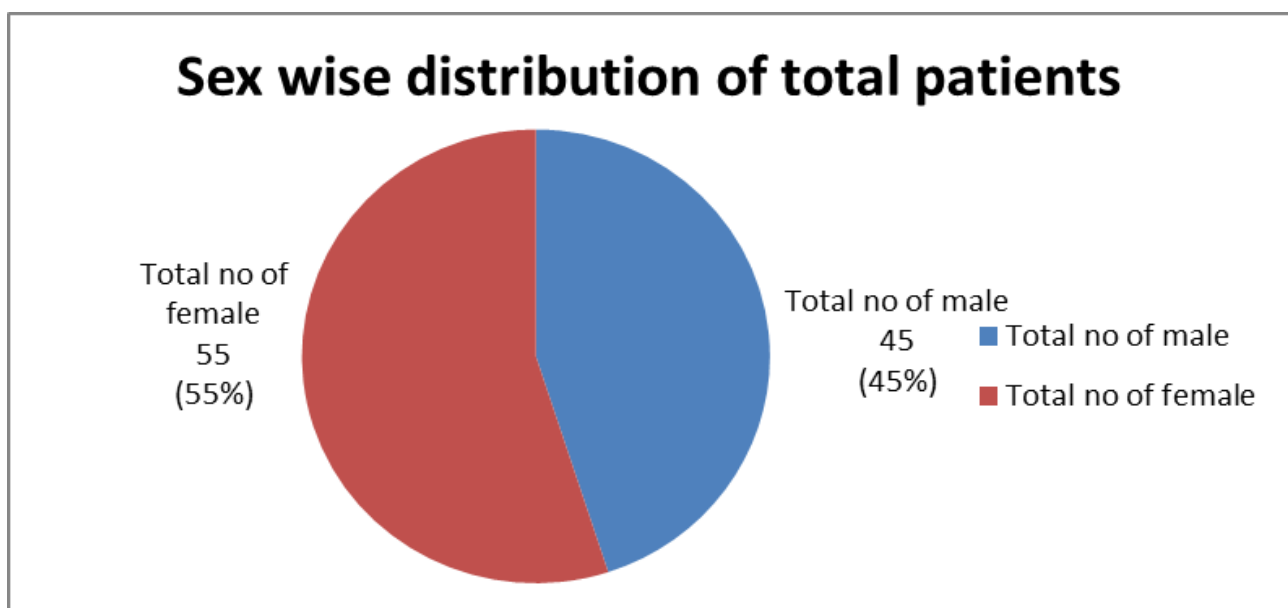
and Khalifa (2001) and Anosike *et al.* (2005) <sup>[10, 11, 12, 13, 14]</sup>. This distribution pattern of dermatophytes infection in different part of the world has been attributed to factors of climate, life-style, and prevalence of immunodeficiency diseases in the community and also the reluctance of patients to seek treatment because of embarrassment or minor nature of disease unless the condition becomes sufficiently serious to affect the quality of life <sup>[15]</sup>. Dermatophyte infections can be disfiguring and recurrent and generally need long-term treatment with antifungal agents <sup>[16]</sup>. The paucity of data on dermatophytosis among the patients in Udaipur. The aim of this study was to ascertain the incidence, prevalence, causative organisms, and source of infection as well as probable methods of transmission of the infection among the peoples.

### Materials and Method

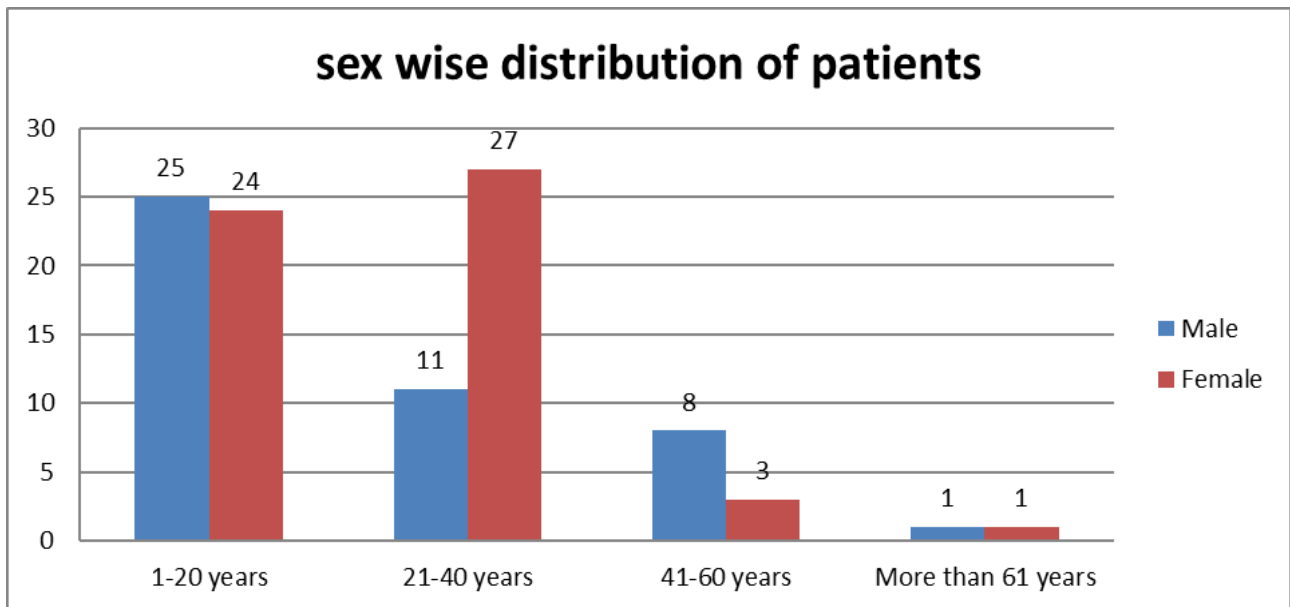
A desk review was done of all Dermatophytes isolated in the laboratory between 2014 and 2016 from patients referred from the out-patient clinics. Patient's data including age, sex, clinical diagnosis, site of infection and referring clinic were processed, identified and analyzed. All specimens were examined by 10% KOH mount and Lactophenol Cotton Blue for screening of fungal element and inoculated on Sabouraud's Dextrose Agar (SDA) with 0.5% mg/ml Chloramphenicol (with or without 0.5 mg/ml Cycloheximide ) at 25 °C in a incubator for three weeks. Fungus isolates were identified according standard procedures <sup>[17]</sup>.

### Result

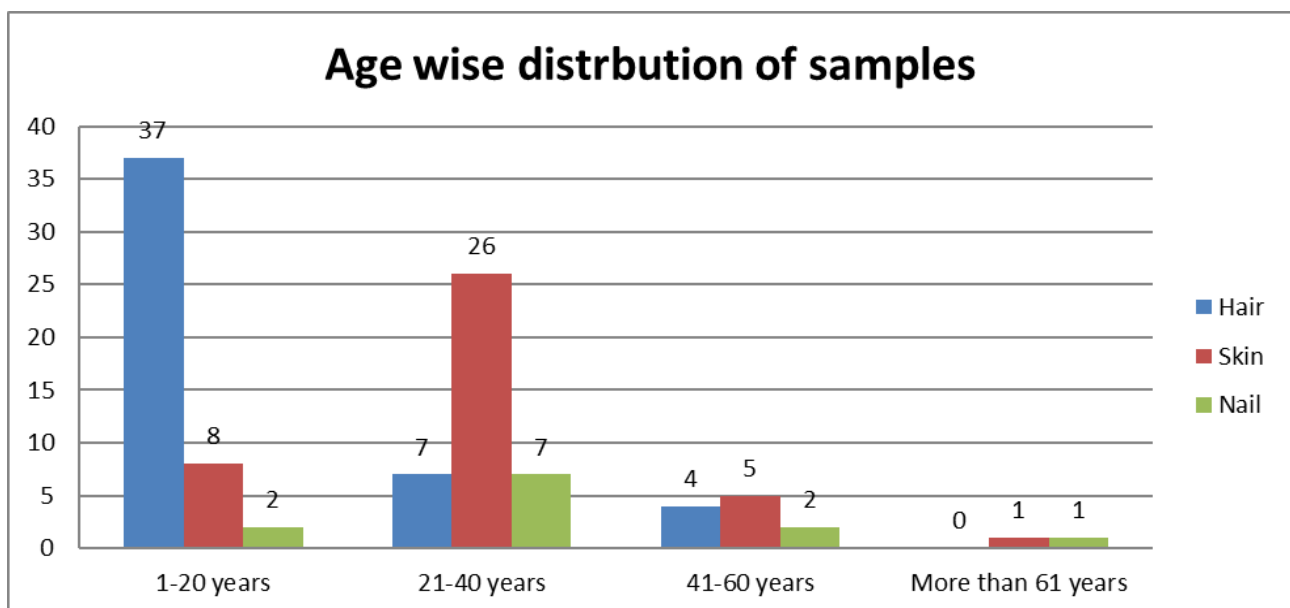
In our present study we included 100 patients suffering from dermatological disorder of any ages from 2015 to 2016 in tertiary care hospital of Udaipur. Out of 100 patients 45 were males and 55 were females. Among them, 40 patients found to be suffering from dermatophytosis, in which 22 (55%) were male and female were 18 (45%).



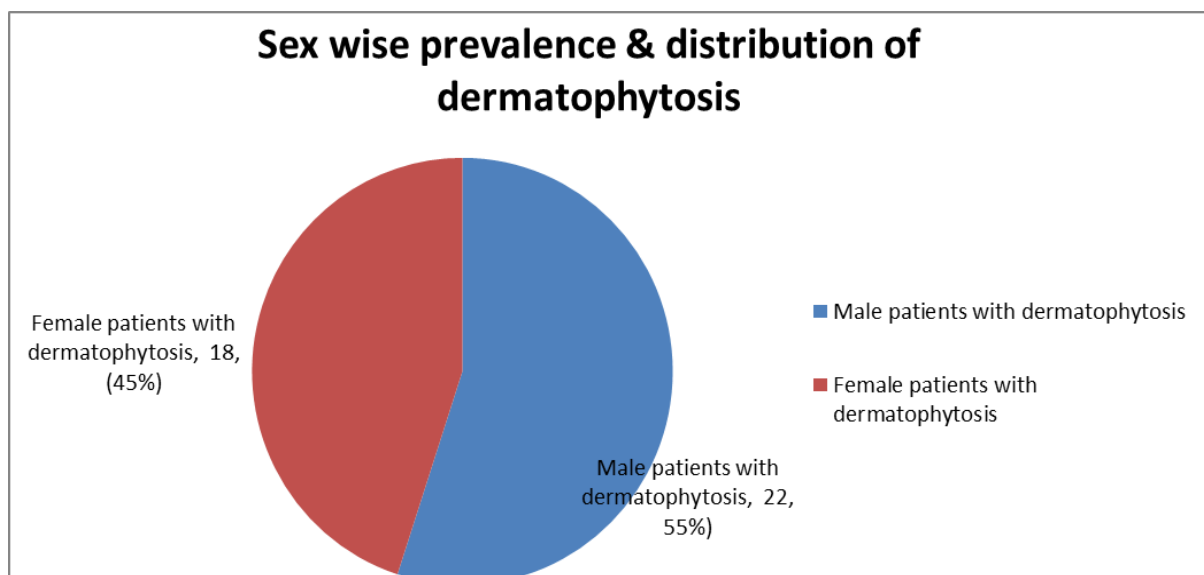
**Fig 1 :** Showing sex wise distribution of total patients



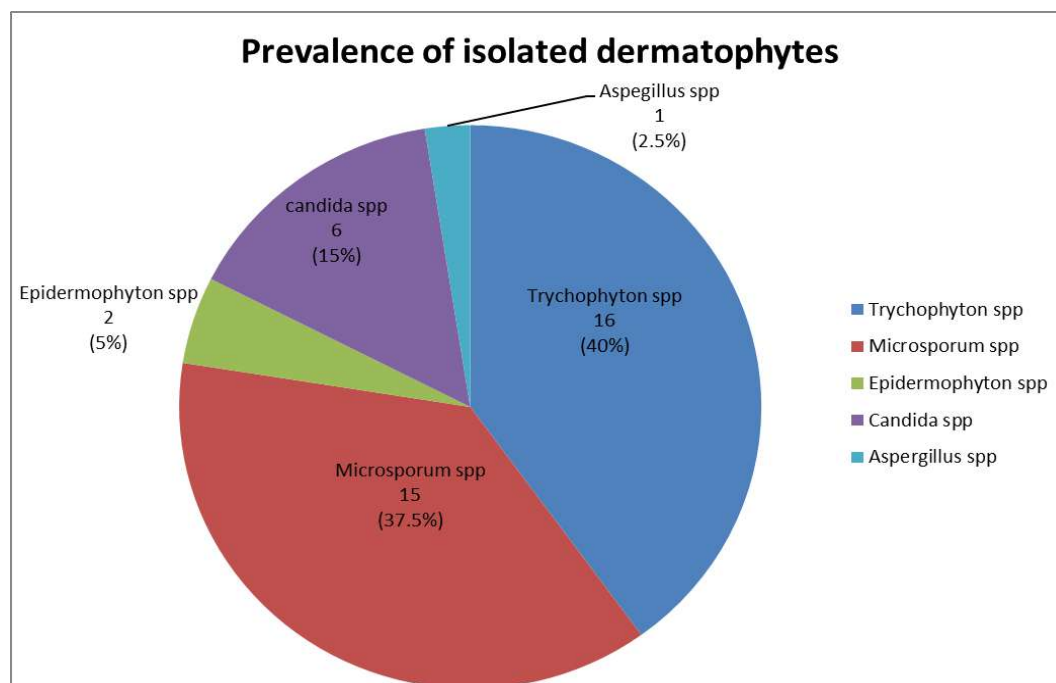
**Fig 2:** Showing sex wise distribution of patients



**Fig 3:** Showing age wise distribution of samples



**Fig 4:** Showing sex wise prevalence and distribution of dermatophytosis



**Fig 5:** Showing prevalence of dermatophytes

Organism were isolated from hair, skin and nail samples of patients were *Trychophyton spp* 16 (40%) were most prevalent followed by *Microsporum spp* 15 (37.5%), *candida spp* 6 (15%), *Epidermophyton spp* 2 (5%) and *Aspergillus spp* 1 (2.5%).

### Discussion

Dermatophytosis is the most common superficial skin infection and constitutes a huge burden on public health systems worldwide [18]. They are generally frequent in areas with high humidity and warm climate which favor the growth of these organisms. The actual prevalence of fungal diseases and their most common causative agents among children and adults in Udaipur are unknown. The causative agents include the dermatophytes, *Candida spp.* and *Aspergillus spp.* They can be transmitted from person to person in various human habitats and also from animals to human especially in children [19, 20]. Several studies conducted worldwide, demonstrated that dermatophytes still the most frequent etiologic agents of skin, nail and hair fungal infections diagnosed [21]. In our study, out of 100 patients 45 were males and 55 were females. Among them, 40 patients found to be suffering from dermatophytosis, in which 22 (55%) were male and female were 18 (45%). Organism were isolated from hair, skin and nail samples of patients were *Trychophyton spp* 16 (40%) were most prevalent followed by *Microsporum spp* 15 (37.5%), *candida spp* 6 (15%), *Epidermophyton spp* 2 (5%) and *Aspergillus spp* 1 (2.5%). Also, dermatophytes (82.5%) were the most common isolates, *Trychophyton spp.* and *Microsporum spp.*, were the most frequently isolated pathogens. These results corresponds to the results obtained by Koksall F., Emine E. and Samasti M. *et al.* found positive result in 46% were females and 54% males, dermatophytes were 74% [22]. An another study by Nahed Al Laham *et al.*, There are 46.8% hair specimens, 38.7% skin specimens and 14.4% nail specimens, dermatophytes genera were the most common pathogens, accounting for 82.3%, followed by *Candida spp.* (14.8%) is similar to our study [23]. Many

studies in different countries around the world as in Mexico, Japan, and Greece where the authors found that dermatophytes were the most prevalent fungal agent which agreement our results [24-26].

### Conclusion

Organism were isolated from hair, skin and nail samples of patients were *Trychophyton spp* 16 (40%) were most prevalent followed by *Microsporum spp* 15 (37.5%), *candida spp* 6 (15%), *Epidermophyton spp* 2 (5%) and *Aspergillus spp* 1 (2.5%). The actual prevalence of fungal diseases and their most common causative agents among children and adults in Udaipur are unknown. The causative agents include the dermatophytes, *Candida spp.* and *Aspergillus spp.* So, we need a proper policy in tertiary care hospitals to provide effective treatment as well as prevent the misuse of Antifungal drugs. However further studies with large sample size is highly recommended to further support the findings from this study.

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