

ORIGINAL RESEARCH

Distribution and Prevalence of Dermatophytosis in tertiary care hospital in Jaipur

Dr. Ashok Roopchand Wadhvani

Associate Professor, Department of Dermatology, Venereology & Leprosy, National Institute of Medical Sciences & Research, Jaipur, Rajasthan, India

Corresponding author

Dr. Ashok Roopchand Wadhvani

Associate Professor, Department of Dermatology, Venereology & Leprosy, National Institute of Medical Sciences & Research, Jaipur, Rajasthan, India

Received: 22 January, 2021

Accepted: 26 February, 2021

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. 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 Lectophenol 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. **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.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Of the more than 40 distinct species of fungus known as dermatophytes—three genera that include *Microsporum*, *Trichophyton*, and *Epidermophyton*—just a small number are frequently associated with human illness. *Trichophyton* species cause infections in the nails, skin, or hair. *Microsporum*: Only skin and hair are infected by *Microsporum* species. *Epidermophyton*: It targets the nails and skin, but leaves the hair unaffected. Since most dermatophytes cannot grow at 37°C or in the presence of serum, they are most likely limited to the non-viable skin. Soil (geophilic), animals (zoophilic), and humans (anthropophilic) can all serve as natural reservoirs for dermatophytes. Anthropophilic dermatophytes have

only or mostly human hosts. Anthropophilic species can spread by fomites, such as contaminated clothing, towels, or shower stalls, or by direct contact. *T. rubrum*, *M. audouinii*, and *Epidermophyton floccosum* are a few examples. Anthropophilic individuals frequently get persistent infections that can be challenging to treat. Animal-loving Species These are the animals' natural parasites. Examples include *M. canis* in dogs and cats and *T. verrucosum* in cattle. Although zoophilic dermatophyte infections in humans result in significant inflammation, they are more easily treated. Invertebrate Species They are comparatively less harmful to humans and can be found naturally in soil. *M. gypseum* and *T. ajelloi* are two examples. Anthropophilic individuals frequently

get persistent infections that can be challenging to treat. Both geophilic and zoophilic dermatophytes typically cause inflammatory lesions that heal nicely with treatment and can also sometimes heal on their own. *E. floccosum*, *T. rubrum*, *T. mentagrophytes*, *T. tonsurans* (anthropophilic), and *M. canis* (zoophilic) are common species that infect humans. These are widespread infectious agents that may be found anywhere in the world, while certain other dermatophyte species are limited to certain regions. They possess the ability to infiltrate keratinized tissues, such as human and animal skin, hair, and nails, resulting in the development of dermatophytosis, an infection popularly known as ringworm. Two [1] Because dermatophytes cannot enter the deeper tissues or organs of immunosuppressed hosts, their infections typically involve cutaneous nonliving tissue. 3 and 4] Even though dermatophytosis is regarded as a minor illness, it has significant psychological impacts and is expensive to treat due to its high morbidity and loss of working days. (5). They are among the most prevalent infectious agents in the world, and in the last few decades, the prevalence of infections brought on by them has increased dramatically to the point where skin mycoses now affect more than 20–25% of the global population, making them one of the most common types of infections. 6, 7] Dermatophytes use keratinase enzymes to break down keratin and infect keratinized tissue. (8) They spread through direct or indirect contact with human lesions, clothing, infected surfaces, shower stalls, combs, brushes, clippers used for barbering, and fomites. In [9] The research by Ayadi et al. (1993), Staats and Korstanje (1995), Weitzman et al. (1998), Ellabib and Khalifa (2001), and Anosike et al. (2005) show variation in the distribution pattern of dermatophytes infection among different countries of the world. [11, 12, 13, 14, 10]

The global distribution pattern of dermatophytes infection has been ascribed to various factors such as climate, lifestyle, and the occurrence of immunodeficiency diseases in the community. Additionally, patients may be reluctant to seek treatment due to the minor nature of their disease or embarrassment, until their condition worsens to the point where it affects their quality of life. In [15] Antifungal medications are typically required for long-term treatment of dermatophyte infections, which can be deforming and recurring. [16] The dearth of information regarding dermatophytosis in Udaipur patients. The purpose of this study was to determine the infection's incidence, prevalence, causative organisms, source, and likely modes of transmission among the Udaipur local population.

MATERIALS AND METHOD

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 Lectophenol 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 [17].

RESULT

In the current study, 100 patients from NIMS Jaipur, tertiary care hospital, afflicted with dermatological disorders of all ages, between 2020 and 2021. Fifty-five patients were female and forty-five were male. Of these, 40 patients were identified as having dermatophytosis, of which 22 (or 55%) were male and 18 (or 45%) were female.

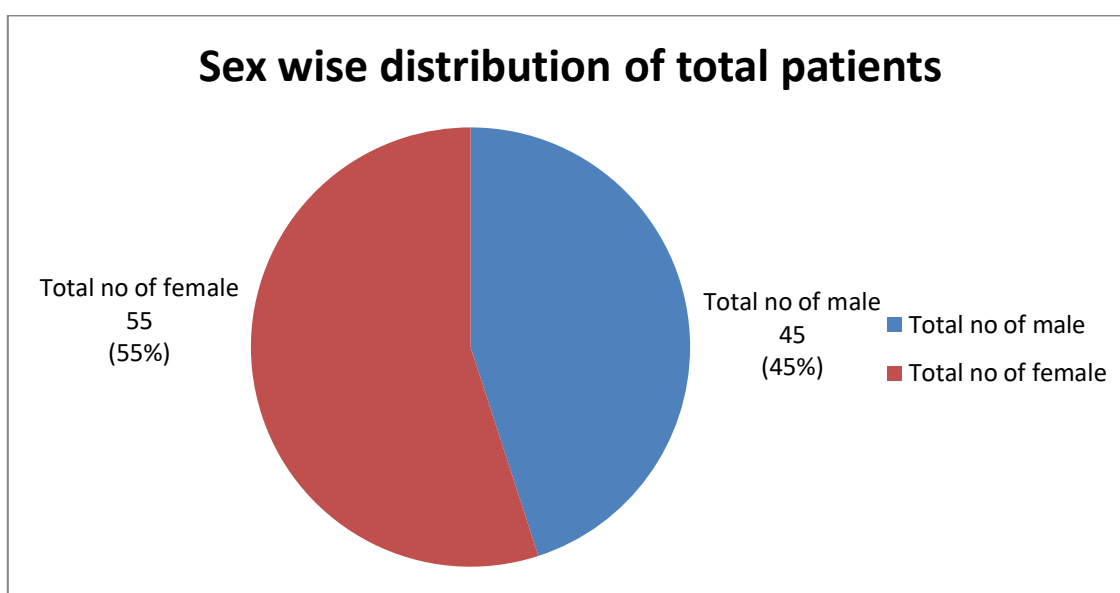


Fig. 1: showing sex wise distribution of total patients

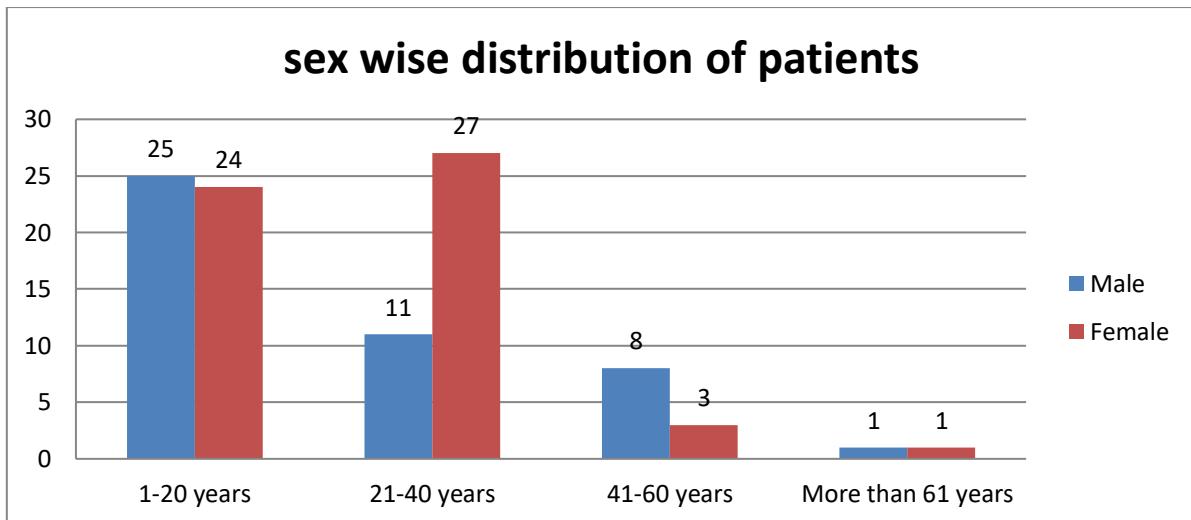


Table 1: showing sex wise distribution of patients

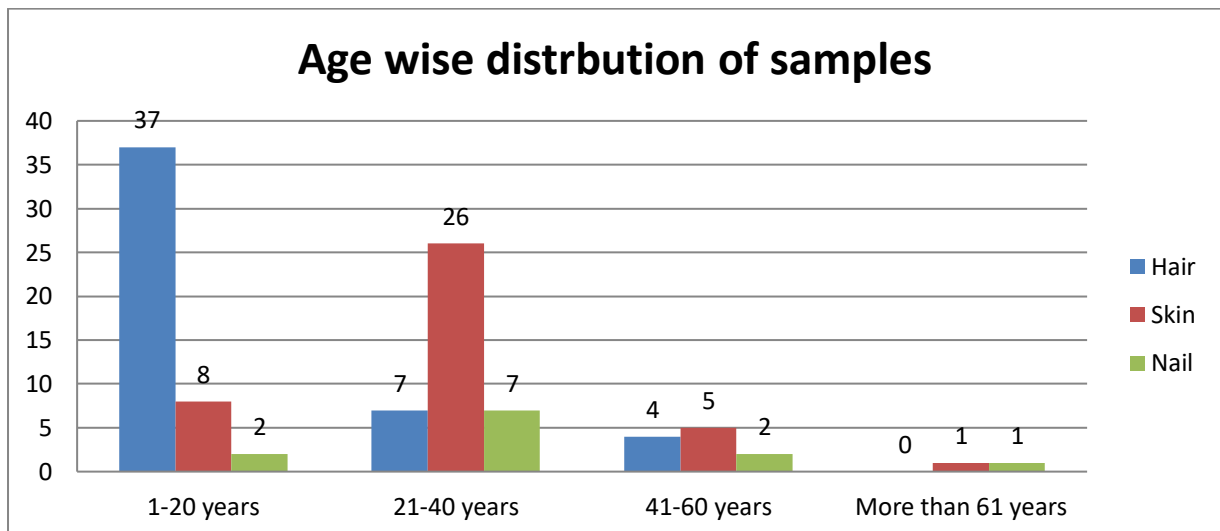


Table 2: showing age wise distribution of samples

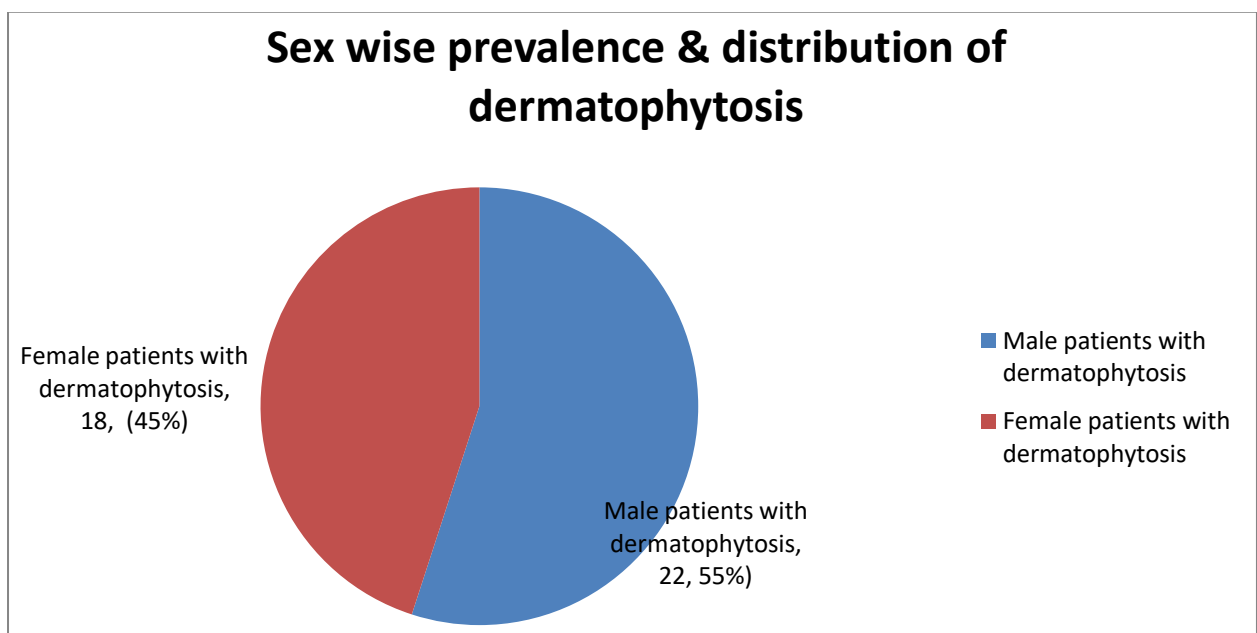


Fig 2: showing sex wise prevalence and distribution of dermatophytosis

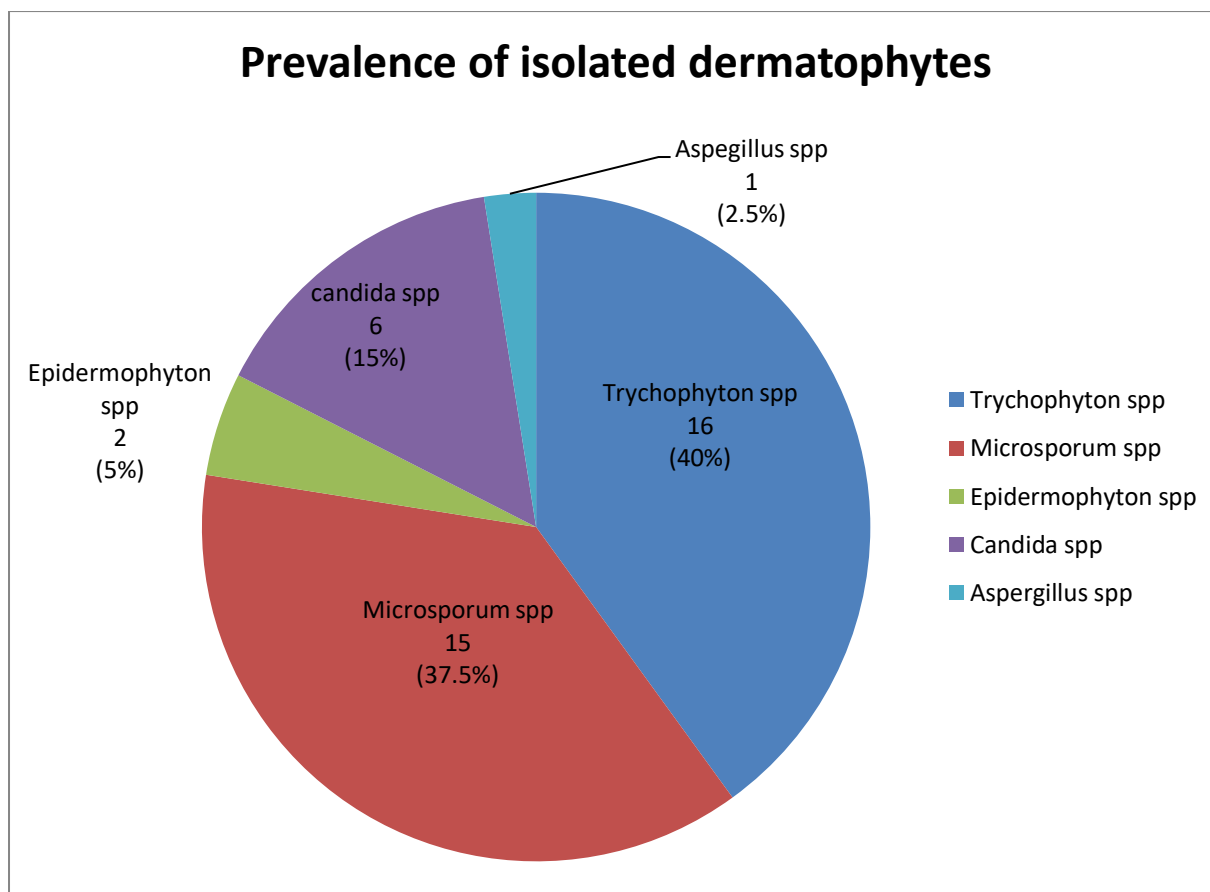


Fig 3: showing prevalence of dermatophytes

Trychophyton spp. 16 (40%) was the most common organism isolated from patient samples of their hair, skin, and nails. Microsporium spp. 15 (37.5%), candida spp. 6 (15%), Epidermophyton spp. 2 (5%) and Aspegillus spp. 1 (2.5%) were the next most common organisms.

DISCUSSION

The most prevalent superficial skin infection, dermatophytosis, is extremely harmful to public health systems across the globe [18]. They are more common in places with high humidity and warm temperatures since these conditions encourage the proliferation of these creatures. It is unknown how common fungal infections are among adults and children in Udaipur, as well as what causes them most frequently. Aspergillus species, Candida species, and dermatophytes are among the causal agents. They can spread from person to person in a variety of human environments as well as from animals to humans, particularly in young children [19, 20]. Numerous international investigations have shown that dermatophytes remain the most common etiologic agents for fungal infections of the skin, nails, and hair [21]. Out of the 100 patients in our study, 45 were men and 55 were women. Of these, 40 patients were identified as having dermatophytosis, of which 22 (or 55%) were male and 18 (or 45%) were female. Trychophyton spp. 16 (40%) was the most common organism isolated from patient samples of their hair, skin, and nails. Microsporium spp. 15 (37.5%), candida spp. 6 (15%), Epidermophyton spp. 2 (5%) and Aspergillus spp. 1 (2.5%) were the next most

common organisms. Additionally, the most often isolated pathogens were Microsporium spp. and Trychophyton spp., with dermatophytes accounting for the majority of isolates (82.5%). These findings are consistent with those of Koksall F., Emine E., Samasti M. et al., who discovered that 74% of the dermatophytes were present in 46% of the male and 54% of the female participants in their study [22]. Similar to our study, another study by Nahed Al Laham et al. found that among the 46.8% hair specimens, 38.7% skin specimens, and 14.4% nail specimens, the most common pathogens were dermatophytes genera, accounting for 82.3%, followed by Candida spp. (14.8%) [23]. Numerous international studies, including those conducted in Greece, Japan, and Mexico, have reported that dermatophytes are the most common type of fungal agent, which is consistent with our findings [24–26].

CONCLUSION

Organism were isolated from hair, skin and nail samples of patients were *Trychophyton spp* 16 (40%) were most prevalent followed by *Microsporium 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.

BIBLIOGRAPHY

1. Wariso, K.T. (2012) Lecture notes in Medical Mycology. Anco Press, Port Harcourt.
2. Willam Irving, Dlawer Ala'Aldeen (2006) BIOS instant notes Medical Mycology. Taylor & Francis Group.
3. Hainer B. Dermatophyte Infections. Am Fam Physician. 2003; 67: 101-8.
4. K. J. Knon-Chung, Medical Mycology, Lea & Febiger, Philadelphia, Pa, USA, 19th edition, 1992.
5. Havlickova B., Czaika V. and Friedrich M. Epidemiological trends in skin mycoses worldwide. Mycoses. 2008; 51 (Suppl. 4), 2-15.
6. Yehia M., El-Ammawi TS., Al-Mazidi KM., Abu El-Ela MA. and AlAjmi HS. The Spectrum of Fungal Infections with a Special Reference to Dermatophytoses in the Capital Area of Kuwait During 2000-2005: A Retrospective Analysis. Mycopathologia. 2010; 169: 241-246.
7. Neji S., Makni F., Cheikhrouhou F., Sellami A., Sellami H., Marreckchi S., Turki H. and Ayadi A. Epidemiology of dermatophytoses in Sfax. Tunisia. Mycoses. 2008; 52: 534-538.
8. Kwon-Chung KJ., Bennet JE. Dermatophytoses (Ringworm, Tinea, Dermatomycosis). In: Med Mycol. PA, USA; 1992. p. 105-161.
9. Barry L. Hainer. American Family Physician 2003;67(1):101-108
10. Ayadi A, Borgi N, Makni F. Prevalence of Superficial mycoses in Prevailing fungi and pattern of infection. Dermatol. 1993; 190: 39-42.
11. Staats C.C., Korstanje M.J. Fungal infections in the Netherlands: an urban ecosystem in Sifax (Tunisia), Bull. Soc. Pathol. Exotique 1995; 86:188-9.
12. Weitzman I, summer bell RC. The dermatophytes. Clin. Microbiol Rev. 1995; 8:240-59.
13. Ellabib M.S, Khalifa Z.M. Dermatophytes and other fungi associated with skin mycoses in Tripoli Libya, Ann. Saudi Med. 2001; 21: 3-4
14. Anosike J C, Keke I.R, Uwaezuoke J.C, Anozie J.C, Obiukwu C.E, NwokeB.E.B, Amajuoyi, O.U. Journal of Applied Sciences & Environmental Management 2005;9(3): 21-25
15. Hashem al sheikh. Epidemiology of Dermatophytes in the Eastern Province of Nepal Research Journal of Microbiology 2009; 4(6): 229-234
16. Dermatophyte infections can be disfiguring and recurrent and generally need long-term treatment with antifungal agents
17. Rippon JW. Dermatophytosis and dermatomycoses in: Medical mycology- the pathogenic fungi and actinomycetes. 3rd ed. Philadelphia: W.B. saunders company; 1988 p. 169-275
18. Soyinka, F. (1978) Epidemiologic Study of Dermatophytes Infections in Nigeria (Clinical Survey and Laboratory Investigations). Mycopathologia, 63, 99-103.
19. Al-Sogair SM., Moawad MK. and Al-Humaidan YM. Fungal infection as a cause of skin disease in the eastern province of Nepal: tinea corporis and tinea cruris. Mycoses. 1991; 34:423-7.
20. Koksall F., Emine E. and Samasti M. Causative Agents of Superficial Mycoses in Istanbul, Turkey: Retrospective Study. Mycopathologia. 2009; 168: 117-123.
21. Akcaglar S., Ener B., Toker S., Ediy B., Tunali S. & Tore O. A comparative study of dermatophyte infections in Bursa, Turkey. Med Mycol. 2011; 49: 602-607.
22. Koksall F., Emine E. and Samasti M. Causative Agents of Superficial Mycoses in Istanbul, Turkey: Retrospective Study. Mycopathologia. 2009; 168: 117-123.
23. Nahed Al Laham et al., Dermatophytosis Among Outpatients in Gaza, Particularly Tinea Capitis. Journal of Al Azhar University-Gaza (Natural Sciences), 2011, 13 : 17-30
24. Welsh O, Welsh E, Ocampo-Candiani J, Gomez M, Vera- Cabrera L. Dermatophytoses in Monterrey, Mexico. Mycoses. 2006;49:119-23.
25. Kasai T. Epidemiological investigation committee for human mycoses in the Japanese society for medical mycology 1997 epidemiological survey of dermatophytoses in Japan. Nippon Ishinkin Gakkai Zasshi. 2001; 42:11-8.
26. Maraki S. and Tselentis Y. Dermatophytoses in Crete, Greece, between 1992 and 1996. Mycoses. 1998; 41:175-8.