ORIGINAL ARTICLE

PREVALENCE OF DERMATOPHYTES IN SKIN, HAIR AND NAIL AT TERTIARY CARE HOSPITAL AT AHMDEABAD

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ABSTRACT

Introduction: Dermatophytosis is common worldwide and continues to increase. Aim of this study was to determine the prevalence of various etiological agents of dermatophytosis in skin outpatient department of a tertiary care hospital, Ahmedabad.

Materials and Method: 125 cases of clinically diagnosed superficial dermatophytic infection were enrolled in this study. Skin scraping, hair plucking and nail clipping were taken for direct KOH mount and culture on Sabouroud's dextrose agar with and without antibiotics and Dermatophyte test medium with supplements.

Result: T. corporis was the predominat clinical manifestation accounting for 32% of the cases. This study comprising of 92 males (73.6%) and 33 females (26.4%) having male to female ratio of 2.78:1. The commonest age group involved was 21-30 years (28%) followed by 11-20years (17.6%). T. rubrum (60.71%) was the commonest isolate followed by T. Mentagrophyte (23.80%). The KOH positivity rate is 73.6% and culture positivity rate is 67.2%.

Conclusion: Further intensive epidemiological studies of Dermatophytic infection which have public health importance are needed.

Keywords: Prevalence, Keratophilic, Dermatophytosis

INTRODUCTION

Dermatophytosis is caused by a group of closely related keratophilic fungi, capable of invading keratinized tissues of skin and its appendages.[1,2] They use keratin as nitrogen source.[3] These mycoses are highly contagious and might develop into epidemics in some population groups, as for example, *tinea pedis* in military personnel and athletes.[3] Its high prevalence in India is due to favorable climatic conditions like high temperature and air humidity. This climate retards sweat evaporation due to high environmental moisture content, thus facilitating fungal dispersion and development. Other factors that favor the high incidence and dissemination of mycoses are poor socio economic development, overpopulation, prolonged contact with domestic animals, hygiene conditions, synthetic clothing, etc.. The increasing use of invasive treatment and medication that affects the immune system (broad spectrum antibiotics, cytotoxic drugs, immunosuppressive drugs) as well as immunosuppressive diseases are some factors associated with the raising incidence of superficial mycoses in the last decades.[1,2,4] Aim of this study was to determine the prevalence of various etiological agents of dermatophytosis in skin outpatient department of a tertiary care hospital, Ahmedabad

MATERIALS AND METHOD

125 cases of clinically diagnosed superficial dermatophytic infection patients attending the out patient department of a tertiary care hospital at Ahmedabad were selected randomly from June 2010 to June 2012. Informed written consent from all participants was taken. These were clinically diagnosed and skin scraping, hair plucking and nail clipping were taken for direct KOH mount and culture on Sabouroud' s dextrose agar with and without antibiotics and Dermatophyte test medium with supplements.

RESULT

This study included 125 cases of clinically diagnosed superficial dermatophytes on random basis. As evident from the table 1, the commonest dermatophytosis was T. corporis in 40 (32%) patients and followed by T. cruris in 35 (28%) patients. This study comprised of 92 males (73.6%) and 33 females (26.4%). There was a high prevalence among males (73.6%) in this study with male to female ratio being 2.78:1. The commonest age group involved was 21-30 years (28%) followed by 11-20 years (17.6%)

Table 1: Prevalence of different clinical types of Tenia infections (n=125)

Clinical Types	No. (%)
T. corporis	40 (32.0)
T. capitis	24 (19.2)
T. cruris	35 (28.0)
T. unguium / onchyomycosis	5 (4.0)
T. manuum	1 (0.8)
T. pedis	4 (3.2)
T. barbae	1 (0.8)
T. faciei	10 (8.0)
T. corporis with T. capitis	0 (0.0)
T. corporis with T. cruris	4 (3.2)
T. corporis with T. faciei	1 (0.8)

As evident from the table 2 T. rubrum (60.71%) was the commonest isolate followed by T.mentagrophyte (23.80%). Out of 125 samples 92(73.6%) were KOH positive and 84(67.2%) were culture positive. In this study 77(61.6%) isolates are KOH positive and culture positive. Out of 77(61.6%) isolates 58(46.4%) from skin samples, 15 (12%) from hair samples and 4 (3.2%) from nail samples. 15 (12%) isolates are KOH positive and culture negative. Out of 15 (12%) isolates 11 (8.8%) from skin samples, 2 (1.6%) from hair samples and 2 (1.6%) from nail samples. 26 (20.8%) isolates are KOH negative and culture negative. Out of 26 (20.8%) isolates 21 (16.8%) from skin samples, 4 (3.2%) from hair samples and 1 (0.8%) from nail samples. 7 (5.6%) isolates are KOH negative and culture positive. Out of 7 (5.6%) isolates 4 (3.2%) from skin samples, 2 (1.6%) from hair samples and 1 (0.8%) from nail samples.

Table 2: Prevalence of different Dermatophyte species (n=84)

Species	No. (%)
T. rubrum	51 (60.71)
T. mentagrophytes	20 (23.80)
T. schoenleinii	2 (2.38)
Microsporumgypseum	1 (1.19)
T. violaceum	2 (2.38)
T. tonsurans	7 (8.33)
E. floccosum	1 (1.19)

DISCUSSION

Superficial mycoses form a large fraction in patients attending the skin out patient department. These infections are not fatal but enzymatic digestion of soft and hard keratin of healthy glossy skin, hair and nails by mycotic infection results in cosmetic disfigurement. In addition affection of skin causes intense pruritis. In present study T.corporis (32%) was the commonest clinical type of Tenia infection and followed by T.cruris (28%). The commonest incidence of T.corporis is consistent with other workers in India such as Madhavi et al[5] (2011) at Hyderabad (27%), Jain Neetu et al[6] (2008) at Jaipur (37.5%), N Patvardhan et al[7] (1999) at Aurangabad (24.57%), Mishra et al[8] (1998) at Brurla Sambalper (24.55%). T.cruris was the second most common clinical type of Tenia infection in our study (28%) and well correlated with study of N Patvardhan et al[7] (1999) at Aurangabad (22.28%), Agarwalla Arun et al[9] (2001) at Nepal (33%), Patil Deena et al[10] (2008) at Belgaun (20.8%).Incidence of T.capitis was (19.2%) in our study which was well correlated with study of Jain Neetu et al[6] (2008) at Jaipur (20%).In present study

the males are more commonly affected than females giving a male:female ratio of 2.78:1. Most of the workers reported a high, male incidence e.g. reported by Jain Neetu et al[6] at Jaipur (2008), Sharma Sunita et al[11] at Assam (2007), Singh S et al[12] Baroda (2003) etc. The high incidence in male is presumably due to higher physical activity in male leading to excess of perspiration in a hot and a humid climate.In our study age distribution revealed maximum incidence in 3rd decade of life (28%) which is in consistence with other workers in India such as Jain Neetu et al[6] (2008) at Jaipur (19.17%) and Sharma Sunita et al[11] (2007) at Assam (39%). Maximum incidence in 3rd decade of life is probably due to heavy physical activity predisposing to increased perspiration. Occupations like labourers doing heavy physical work predispose them to excess perspiration in a humid environment. Exposure to soil i.e. farming occupation and exposure to animal predispose such people to infection. As universally reported by most of the workers, T. capitis is an infection of childhood. Out of 24 patients, 15 patients belong to 0-10 year of age group. The changing pattern of hormones after puberty is held responsible for decrease in the incidence of T. capitis with age. Children are more exposed to risk factors, such as poor hygiene, crowded schools and day care centers and favourable PH of sebaceous gland secretions. Direct contact with animals and playing with sand contribute to a higher occurrence of this condition in this age group.[19] Children are less affected by onychomycoses due to faster growth rate of the nail and reduced superficial area for spore invasion. On the other hand, onychomycoses are more frequent in the elderly population due to reduced growth rate of the ungula plate, poor peripheral circulation, diabetes and inability to maintain good foot care.[13] The two extremes of age showed the least incidence of infection. The findings are consistent with other studies.

T. rubrum (60.71%) was the commonest dermatophyte isolated in our study which correlates with other studies e.g. Madhavi S et al[5] (2011) at Hyderabad (51.72%), Lal Sardari et al[14](1983) at costal area(57.10%) , V Bindu et al[15] (2002) at Calicut (66.20%), Mahendra et al[16] (1996) at Madras (58.40%), Kumar Kennedy et al[17] (2007) at Chennai (67.50%) and Sen S.S. et al [18](2006) at Assam(68.63%). T. rubrum was the main isolate from cases of T. corporis (47.05%) and T. cruris (33.33%). The reasons for overall high isolation of T. rubrum are:

1. T. rubrum has an affinity for inhospitable and tough keratin, like that of palms, soles and nails.
2. No age group is spared.
3. T. rubrum have remarkable adaptability.

T. mentagrophyte (23.80%) was the second most common dermatophyte isolated in our study which correlates with other studies e.g. MadhaviS et al[14] (2011) at Hyderabad (31%), Sen S.S. et al[18] (2006) at Assam (25.53%), Kumar Kennedy et al[17](2007) at Chennai (18.00%), AgarwallaArun et al[9] (2001) at Nepal (25%), Mishra M. Et al[8](1998) at Burla-Sambalpur (26.60%), Sharma Sunita et al[11](2007) at Assam (22.95%).

In this study out of 125 cases – 77 isolates were positive on direct KOH examination and culture, 15 isolates were positive on direct KOH but negative on culture, 26 were KOH negative and culture negative and 7 isolates were negative on direct KOH and culture positive.

Our KOH positivity was 73.6% which is almost near to other workers e.g. Jain Neetu et al[6] (2008) at Jaipur (72.5%), V Bindu et al[15] (2002) at Calicut (64%) and Singh S et al[12] (2003) at Baroda (60.38%). Our culture positivity was 67.2% which is almost near to other workers e.g.. Jain Neetuet al[6] (2008) at Jaipur (58.33%) and Amin AG et al[19] (1971) at Ahmedabad (68.79%). Our culture positivity rate is higher than many other study e.g. Sen S et al[18] (2006) at Assam (47%), Singh S et al[12] (2003) at Baroda (44.62%) and N Patvardhan et al[7] (1999) at Aurangabad (40.90%). Discrepancy observed between detecting fungal hyphae in direct microscopy and culture is mainly due to various contributory factors involved in collection, transport, inoculation of specimen, culture conditions, severity, type and stage of lesion and effect of antifungal ointments and creams applied. The small size of sample and contamination during transport may be responsible. In this study 7 isolates (5.6%) were culture positive and KOH negative may be due to fungal hyphae missed in direct KOH mount.

CONCLUSION

Ringworm infections are more prevalent in male than in females. Male to female ratio is 2.78:1. Age distribution reveals maximum incidence in 3rd decade of life (28%). Teniacorporis (32%) is the most common clinical presentation. The commonest dermatophyte isolated is Trichophytonrubrum (60.71%), followed by Trichophytonmentagrophyte (23.80%). The KOH positivity rate is 73.6% and culture positivity rate is 67.2%. SDA with and without antibiotics; and Dermatophyte test medium with supplements give satisfactory results for primary isolation. Our results are comparable with some of the reports available from other authors in India and abroad.

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