PREVALENCE AND SPECIES PROFILE OF DERMATOPHYTOSIS AMONG HIV POSITIVE PATIENTS IN RURAL REFERAL CENTRE

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ABSTRACT

Out of 238 HIV infected patients with dermatological diseases screened, the diagnosis of dermatophytosis was made clinically in 56 cases. Prevalence of dermatophytosis was 6.06%. Most of the cases were from the age group of 20-24 years. Male to female ratio is 10.2:1. Tinea corporis was the commonest dermatophyte infection followed by tinea cruris, tinea ungii, tinea manus and tinea faciei. Fourteen patients presented with extensive form with mixed clinical types. KOH mount (n=38, 67.85%) yielded more positive results than culture (n=32, 57.14%) in Sabouraud Dextrose Agar. Trichophyton rubrum (n=20, 62.5%) was the most common species isolated followed by Trichophyton mentagrophytes. This study has brought into focus variations in presentations of dermatophytosis and the common species involved in the disease.

KEY WORDS : Dermatophytosis, Species, HIV/AIDS, IRT-PMCH.

INTRODUCTION

Superficial fungal infections (Dermatomycoses) are very common and occur throughout the world. Most of these infections are caused by dermatophytic molds1. Dermatophytosis refers to superficial fungal infection of keratinised tissue caused by dermatophytes. There are three genera of dermatophytes

- Trichophyton (skin, hair, nail)
- Microsporum (hair, skin)
- Epidermophytopon (skin, nail)

Dermatophytosis is a trivial disease but has lot of psychological effects and a costly disease in terms of treatment². Dermatophytosis is common in HIV infected persons and can occur at some point during their illness³. The severity and variability of presentation are more common in people living with HIV/AIDS⁴. Goodman et al⁵ observed that the prevalence of dermatophytosis was four times higher among HIV infected population and it followed a normal pattern, but atypical forms are extensive in HIV infected individuals⁶. Symptomatology can be very unusual.

Prevalence varies from 8% to 32.9%⁶⁷. Tinea corporis is the setting of HIV disease, virtually always is tinea cruris that has extended beyond the groin into the trunk. This extensive form of tinea occurs in hot humid climate and may be seen at all levels of immuno-suppression⁸. In severely immuno-suppressed patients with AIDS, lesions have little inflammation and often lack the elevated border and central clearing typical of tinea (anergic tinea). They are recognized as sharply margined areas of hyperkeratosis resembling dry skin.

Tinea cruris due to Microsporum canis, diffuse folliculitis due to Trichophyton rubrum or Microsporum canis, paronychia, palmoplantar keratoderma due to T. rubrum, and disseminated dermatophytosis are often observed⁹.

Goodman et al⁵ observed several cases of tinea capitis with significant hair loss. Grossman et al¹⁰ reported invasive Trichophyton rubrum infections
like Majocchis granuloma, papules, nodules and abscesses in immuno-compromised patients. Tosssander et al found T.rubrum being the predominant species involved in the causation of dermatophytosis in their HIV seropositive patients.

The onychomycosis caused by T.rubrum may either present independently or in association with palmoplantar hyperkeratosis but characteristically paronychium is more involved in HIV infected patients, which is usually spared in other. Onychomycosis in HIV infection commonly involves the toenails, proximal subungal onychomycosis and superficial white onychomycosis are commonly observed in HIV patients. The prevalence of onychomycosis in HIV-positive individuals with normal appearing nails was 5.3%. HIV-positive patients may have a higher prevalence of onychomycosis that develops at a relatively young age compared to the immuno competent population.

The frequency rate of epidermal dermatophytosis in HIV disease is not significantly higher than that in HIV-negative patients in some studies. The low incidence of dermatophytosis in HIV disease may be secondary to improved antiretroviral therapy and the treatment of individuals with mucosal candidiasis and invasive fungal infections with systemic azoles. This is supported by a 1995 study in which the prevalence of tinea infections and onychomycosis was 36% in patients with CD4 counts above 200/mm³ vs. 18% in those with CD4 counts below 200/mm³.

In view of the above mentioned reasons the present study was undertaken to assess the following:

1. To note the prevalence of dermatophyte infection among HIV infected patients.
2. To identify the most common dermatophytic species associated with HIV positive patients.
3. To compare the clinical diagnosis with KOH smear and culture results.

MATERIALS AND METHODS

It was a descriptive study in which all HIV seropositive patients (by double ELISA method) who attended the Dermatology and STD out patients department were screened for cutaneous fungal infection and those with dermatophytosis were recruited for this study. The study was conducted in the month of June to July 2004 at IRT Perundurai Medical College, Perundurai. Detailed history including age, sex, socio-economic status, occupation, marital status, sexual history, duration of the skin lesion were obtained and patients were subjected to thorough physical examination.

The clinical diagnosis was supplemented with laboratory procedures like microscopic examination of the scraping of skin, scalp, and nail with KOH wet mount preparation and culture. For primary isolation, Sabouraud's Dextrose Agar (SDA) slope with antibiotics was used. For species identification the culture was examined under Lacto phenol cotton Blue mount. Routine haematological, bio-chemical and radiological investigations were performed to rule out any systemic involvement wherever felt necessary. All mycology studies were performed centrally at the Department of Microbiology. The results were tabulated and analysed.

OBSERVATIONS AND DISCUSSION

The HIV positive patients attending the department of Dermatology and Venereology from June to July 2004 were 924. Among them, 238 (26%) were found to suffer from various dermatological illnesses. Fifty-six HIV positive patients with clinically suspected dermatophytic infections of the skin were enrolled for the study. All the patients were confirmed cases of HIV infection (Double ELISA method) in various stages (CDC). During the study period, fifty-one male (91%) and five female (9%) patients were screened and observed. Male to female ratio was 10.2:1. Majority of them belonged to rural areas. Age of the subjects varied from teenage to old age. Nearly one half of the patients (n=23) were in highly active sexual age group (20-34 years of age). The higher incidence in young males could be due to greater physical activity, increased sweating, use of occlusive clothing and synthetic fabrics.

About two third of patients either had primary education or without any education. Only 9% of them had college education. Nearly 82% (n=46) of them belonged to middle income group.
Regarding occupational status, most of them belonged to skilled/semiskilled labourers (n=25), followed by agricultural workers (n=11) and transport workers. In females most of them were housewives. This implies that HIV is now prevalent in all groups. In our study group (n=924), 238 were symptomatic in relation to skin and STD. Chief presenting complaint of those who were found to suffer from tinea infection was itching (n=54,96.4%), only two (3.6%) did not have the above symptoms.

Duration of the superficial dermatophytic infection at the time of presentation varied from 7 days to 2 years. Chronicity of the infection (duration > 6 months) was noticed in eighteen (32.14%) study subjects. Thirty-eight (67.86%) patients had dermatomycosis for less than six months. Contact with family members and non-family members suffering from similar illness was observed in 16% (n=9) of the study population. This confirms that dermatophytic infections are transmitted from person to person by sharing common household clothes and by fomites.

History of contact with pet animals was noticed in 19 cases (33.9%). This affirms that infected household pets play an important role in the transmission and recurrence of the infection. In our study, dogs and cats were the pets among non-farmers. Among the agricultural labourers, cow, buffalo, ox, sheep were the farm animals (reservoir of infections) noticed in the decreasing order of frequency. History of contact with soil was seen in 25% (n=14) of the study subjects. Contact with both pet animals and soil was seen in 5 cases (all were agricultural labourers). Dermatophyte infections are common in HIV infected patients. In one survey for example, the prevalence of dermatophytosis was not significantly higher in a group of HIV infected patients (37%) than in a paired population of HIV homosexual males (32%). These investigators noted that superficial fungal infections were more common in both groups of homosexual males than in the general population.

In another study, however, the prevalence of dermatophytosis was four times higher amongst HIV-infected persons. Kumarasamy et al in their study from south India, found 8.0 percent of HIV infected patients having dermatophytosis. Its frequency was 6.06% in the present study.

Tinea corporis was the commonest dermatophyte infection and was seen in 46 cases (82.14%), followed by tinea cruris in 39 cases (69.64%), tinea manuum in 4 (7.14%), tinea faciei in 3 (5.35%), tinea axillaris in 2 (3.53%), tinea genitalis in 2 (3.53%). Tinea unguium was recorded in 8 cases. (Table 1)

Table 1: Morphological Pattern of Dermatophytosis

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Dermatophytosis</th>
<th>Number of Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tinea corporis</td>
<td>46</td>
<td>82.14</td>
</tr>
<tr>
<td>2</td>
<td>T. cruris</td>
<td>39</td>
<td>69.64</td>
</tr>
<tr>
<td>3</td>
<td>T. unguium</td>
<td>08</td>
<td>14.29</td>
</tr>
<tr>
<td>4</td>
<td>T. manuum</td>
<td>04</td>
<td>07.14</td>
</tr>
<tr>
<td>5</td>
<td>T. faciei</td>
<td>03</td>
<td>05.35</td>
</tr>
<tr>
<td>6</td>
<td>T. genitalis</td>
<td>02</td>
<td>03.53</td>
</tr>
<tr>
<td>7</td>
<td>T. axillaris</td>
<td>02</td>
<td>03.53</td>
</tr>
<tr>
<td>8</td>
<td>T. pedis</td>
<td>01</td>
<td>01.80</td>
</tr>
<tr>
<td>9</td>
<td>T. barbae</td>
<td>01</td>
<td>01.80</td>
</tr>
<tr>
<td>10</td>
<td>T. incognito</td>
<td>01</td>
<td>01.80</td>
</tr>
</tbody>
</table>

Tinea pedis, tinea barbae, tinea incognito were also seen. Tinea genitalis lesions were found only in male subjects (shaft of the penis).

Out of the 46 patients with tinea corporis, majority of them presented with classical features [sharply marginated scaly patches, with raised inflammatory edge studded with papules and vesicles]. Few of them (n=5) had lesions resembling ill-defined, hyperkeratotic, and xerotic skin. Tinea corporis lesions were distributed over lower abdomen, gluteal region, front and back of chest, upper limb, legs and back of neck in decreasing order of frequency. Extensive dermatophytosis (multiple tinea corporis lesions) with mixed clinical types was seen in 25% (n=14) of the study group. Such a similar finding (19.9%) has been reported by P.K. Kaviarasan et al and Bindu V. Torssander et al did not find extensive Dermatophytosis in his study population. No difference in clinical presentation in HIV infected population was recorded in a study done by Sentamil selvi et al.
Among the patients with Dermatophytic infection, tinea corporis was the commonest (82.14%) dermatophytosis which was in accordance with study by P.K.Kaviarasan et al. This is in contrast with that of Goodman et al and Torssander et al, where tinea pedis was the commonest dermatophytosis.

Tinea cruris was the second commonest clinical type 69.64% (n=39) and some of the patients in the study group had extensive involvement, which extended beyond the groin on to the thighs, gluteal region and to the lower abdomen (Fig.1). Two patients of tinea cruris had involvement of shaft of the penis (Tinea genitalis).

Subungal Onychomycosis (n=4, 7.14%) followed by Distal and Lateral Subungal Onychomycosis (n=3, 5.35%). One patient had Total Dystrophic Onychomycosis (1.8%). These findings are in accordance with Goodman et al in which Proximal Subungal Onychomycosis was the most common form of onychomycosis, but P.K.Kaviarasan et al reported all types of onychomycosis in their study. Proximal White Subungal Onychomycosis is rare in immunocompetent individuals and it is nearly pathognomonic of HIV infection.

This study confirms the observation done by Aditya K Gupta et al that patients who are HIV positive are predisposed to the development of infection including tinea pedis and onychomycosis. We did not encounter nail infection alone. Our study subjects also had other clinical types.

Goodman et al observed several cases of tinea capitis with significant hair loss. Tinea capitis was not encountered in our study group as there were no children in the study group. Grossman et al reported invasive Trichophyton rubrum infections like Majocchis granuloma, papules, nodules and abscess in immuno-compromised patients, but no such cases were seen in our study. Similar observations were reported by P.K.Kaviarasan et al.

Tinea incognito was seen in 1.8% of the study population (anterior abdomen in a HIV-positive woman. Fig.3). It developed due to long term usage of potent topical steroids (clobetasol propionate cream).

Prevalence of tinea unguium in this study was 14.18% (n=8). In Canadian and Brazilian groups, the prevalence of onychomycosis was 24% and 20% respectively, with a prevalence rate of 23.2% for the combined group. Our prevalence was slightly lower than their studies on HIV positive individuals.

The prevalence of onychomycosis in HIV-positive individual with normal appearing nail was 5.3% in a study done by Aditya K Gupta et al. Tinea unguium in HIV infection commonly involves toenails. This was seen in 5 (8.9%) of the study subjects. Two (3.6%) had only affection of fingernails (Fig.2). One subject had affection of both. All the patients presented with disfigurement / brittleness of nails.

Commonest clinical type observed was Proximal
diagnosis of dermatophytosis (Table 2).

**Table 2: Results of direct microscopic findings and culture reports**

<table>
<thead>
<tr>
<th>KOH +ve &amp; Culture +ve</th>
<th>KOH +ve &amp; Culture -ve</th>
<th>KOH -ve &amp; Culture +ve</th>
<th>KOH -ve &amp; Culture -ve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Percentage (%)</td>
<td>Number</td>
<td>Percentage (%)</td>
</tr>
<tr>
<td>27</td>
<td>48.21</td>
<td>11</td>
<td>19.64</td>
</tr>
<tr>
<td>05</td>
<td>08.93</td>
<td>13</td>
<td>23.22</td>
</tr>
</tbody>
</table>

Trichophyton rubrum (n=20) was the commonest species isolated in all clinical types (Table 3). On macroscopy in SDA, the colonies appeared as flat or glabrous spreading, powdery, and cottytony white with non-diffusible red pigment on the reverse (Fig 4). Torssander et al.¹⁴ found T. rubrum being the predominant species involved in the causation of their HIV sero-positive patients, which was also noticed in our study.

**Table 3: Dermatophytes Isolated**

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of Cases</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trichophyton rubrum</td>
<td>20</td>
<td>62.5</td>
</tr>
<tr>
<td>T. mentagrophytes</td>
<td>12</td>
<td>37.5</td>
</tr>
</tbody>
</table>

The second common species isolate was T. mentagrophytes (n=12). This in keeping with other studies from India. On gross examination of the positive culture in SDA, colonies appeared as flat, spreading, powdery, white to cream coloured with dull yellow under surface (Fig 5).

**CONCLUSION**

Though frequency rate of dermatophytosis in HIV infected patients is not significantly higher, severity and variability in clinical presentation, isolation of uncommon species and emerging anti-fungal drug resistance are becoming more common. Hence more studies are needed in this arena.

**ACKNOWLEDGEMENTS**

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**REFERENCES**