Research Paper

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A Clinico-Mycological Study of Chronic Dermatophytosis of More Than Years Duration

Medical Science

KEYWORDS : Chronic dermatophytosis, diabetes mellitus, Trichophyton rubrum

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ABSTRACT

Background: Chronic dermatophytosis is a psycho-social and economic burden to the patients. The growing number of immunocompromised patients due to human immuno defiency viral infections and organ transplantations has led to increased incidence of dermatophytosis. Aim of the study: To bring out the recent trends in the age, sex distribution, causative species, and factors associated with chronic dermatophytosis. Materials and methods: This study was conducted in the mycology section of department of dermatology in a tertiary care centre in Chennai. Patients having dermatophytosis for duration of 3 years and above were selected for the study. Results: Around 60 patients were included for the study, of which 24 were male and 36 female. The common age group affected was in 30-40 years. Diabetes mellitus (30%) and bronchial asthma (16.6%) were the most frequent systemic associations observed in this study. Tinea corporis and tinea capitis were the commonest and rarest clinical types respectively. The most frequent isolate was Trichophyton rubrum. Conclusion: More studies are warranted to find out the factors responsible for the chronicity of dermatophytosis.

Introduction

Dermatophytosis is a group of taxonomically related fungi that utilize keratin as a source of nutrients and colonize keratinized tissues including stratum corneum of epidermis, nail, and hair. [1] Dermatophytosis is the leading cause of cutaneous fungal infection. Chronic dermatophytosis is a psycho- social and economical burden to the patients and their family members. These patients act as source of infection constantly spreading with or without their knowledge. Remissions and exacerbations mark the course of the disease and chronic dermatophytosis still remains a challenge to the practicing dermatologist. Multiple factors like geographic area, climate, immunocompetence of the host, pathogenicity of the agent and availability of the treatment may affect the incidence and chronicity of fungal infection within a population. [2] The growing number of immunocompromised patients due to chemotherapy, transplantations, and HIV infection has led to increased incidence of dermatophytosis. This study aims to bring out the recent trends in the age, sex, distribution, causative species, and factors associated with chronic dermatophytosis of more than 3 years.

MATERIALS AND METHODS : This study was conducted in the mycology section of department of dermatology of a tertiary care centre in Chennai. Patients having dermatophytosis with duration of 3 years and above were selected for the study after obtaining informed consent. Detailed case history of each patient with reference to the occupation, symptoms, duration of infection, treatment taken, contact with animals or other infected persons were recorded. Clinical features like sites of involvement, morphology of lesions, and other associated systemic and cutaneous disorders were noted. The pattern of nail involvement was also noted. Complete hemogram, blood sugar, renal function tests and absolute eosinophil count were also done to detect associated disorders. Blood VDRL for syphilis and ELISA for HIV infection were done in high risk patients. Mycological examination: Skin and nail scrapings were collected from all the patients and examined in 10 – 40%. Potassium hydroxide mounts for presence of fungal elements. All the above specimens were subjected to culture. In the case of skin lesions, the site was cleaned with 70% alcohol before collecting the specimen. Inoculation was done on modified Sabouraud's Dextrose Agar with and without cycloheximide and chloramphenicol. All the inoculated slants were incubated at 26o C and observed for growth of colonies for a period of 4 weeks. The isolates were studied for the rate of growth, macroscopic morphology and pigment production. Microscopic examination for the morphological characters of the isolates was done in lactophenol cotton blue mount. All the patients were treated with topical 2% clotrimazole cream and systemic griseofulvin in dose of 10 mg/kg body weight for a duration of 4 – 6 weeks. Those who did not respond to the above were started on oral fluconozole 150mg biweekly or ketoconazole 200 mg once daily for 4 to 6 weeks. One patient with nail infection was treated with oral terbinafine 250 mg once daily for 3 months.

Results

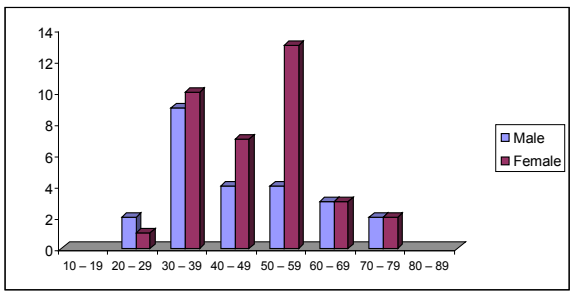
Around 60 chronic dermatophytosis patients with duration of 3 years and above were chosen for this study. Of them, 24 were males and 36 were females. Females outnumbered males in this study. The male: female ratio was 1: 1.5.

The age of the patients ranged from 23 to 75 years with a mean age of 47.18 years. The age group most commonly affected was between 30 – 40 years (Chart - 1) with 10 females and 9 males in this group. Males were more in this group (Table – 1), while females were affected more between 50 – 60 years. About 13 women were in this age group. The duration of the dermatophytosis infection varied from 3 to 35 years with a mean duration of 7.35 years.

Table – 1: Distribution of Age

Age group (Years)	Male	Female
10 – 19	-	-
20 – 29	2	1
30 – 39	9	10
40 – 49	4	7
50 – 59	4	13
60 – 69	3	3
70 – 79	2	2
80 – 89	-	-

Chart – 1: Frequency Distribution of Age



Diabetes mellitus was the most frequent systemic association observed in this study of chronic dermatophytosis. About 18 (30%) patients were diabetic. Next common association was bronchial asthma with 10 (16.6%) suffering from it (Figure 1). Among the asthmatics, 1 had diabetes mellitus and 2 had hypothyroidism, 4 patients were on long term steroid treatment. 2 patients of Diabetes had hypothyroidism and 1 had pemphigus vulgaris. It was also observed that 2 patients had systemic lupus erythematosis, 1 had chronic obstructive lung disease, 1 had renal transplantation and 1 was hypertensive and 4 had HIV infection (Figure 2). Cutaneous disorders like palmoplantar psoriasis (1), pemphigus vulgaris on systemic steroids (1), candidiasis (1), discoid lupus erythematosis (2), pitted keratolysis (1), angioedema and icthyosis vulgaris (1) were also observed in this study (Table.2). About 2 patients gave history of irregularity in taking the antifungal drugs resulting in treatment failure.

Figure 1: Tinea Corporis in a Bronchial Asthma patient

Figure 2: Tinea Corporis in a HIV patient

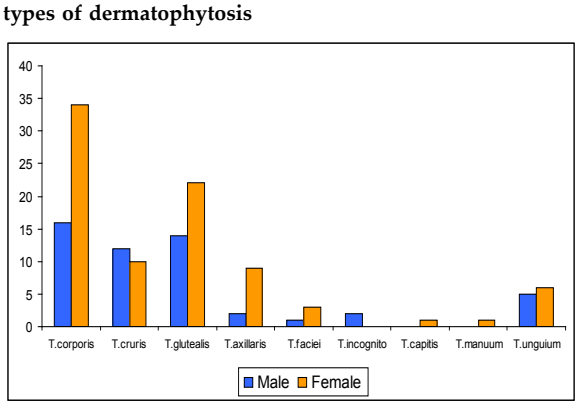
Table – 2: Associated Disorders observed in Chronic Dermatophytosis

S. No	Systemic Disorders	No. of patients	Cutaneous disorders	No. of patients
1	Diabetes mellitus	16	Icthyosis vulgaris	1
2	Bronchial asthma	8	Discoid lupus erythematosis	2
3	Bronchial asthma on systemic steroids	4	Pemphigus vulgaris on systemic steroids.	1
4	Human immunodeficiency virus infection	4	Pitted Keratolysis	1
5	Bronchial asthma with hypothyroidism	2	Oral candidiasis	1
6	Treatment failure	2	Palmoplantar psoriasis	1
7	Systemic lupus erythematosis	2	Angioedema	1
8	Diabetes mellitus with hypothyroidism	2		
9	Chronic obstructive lung disease	1		
10	Renal transplantation	1		
11	Hypertension	1		

Table – 3: Distribution of the clinical types of dermatophytosis

S.No.	Clinical type	Male	Female
1	Tinea corporis	16	34
2	Tinea glutealis	14	22
3	Tinea cruris	12	10
4	Tinea axillaries	2	9
5	Tinea unguium	5	6
6	Tinea incognito	2	-
7	Tinea faciei	1	3
8	Tinea manuum	-	1
9	Tinea capitis	-	1

Chart -2: Frequency distribution of the various clinical types of dermatophytosis



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Tinea corporis was the commonest type of presentation with 94.4% of females and 66.6% of males being affected. The most affected site was waist in females and back in males. Most of the lesions showed hyperpigmentation and mild scaling without central clearance. Tinea glutealis was the second commonest type in both sexes. 61% of females and 58% of males were affected. Tinea cruris was common in males (50%) when compared with females (27%). Similarly tinea unguium was frequent in males (20%) than females (16%). But tinea axillaris was more common in females than males (Table – 3). Multiple site involvement with more than one type of clinical presentation was seen in 78% of the patients. About 5 out of 11 cases of tinea unguium were associated with multiple site infection. Proximal subungual white onychomycosis (Figure.3) was observed in a HIV patient. All the other tinea unguium cases were of distal and lateral subungual onychomycosis type. One patient had erythroderma type. He also had Bronchial asthma and was on long term systemic steroids. The mean surface area involved was 28.3%. Out of the 60 patients, 10 patients were lost for follow-up.

Figure 3: Proximal Subungual White Onychomycosis in a HIV patient

Culture was done only for 50 patients and all of them had shown positive results in potassium hydroxide mount examination. The culture positivity for dermatophyte isolation in this study was 52% (Table.4). The most frequent isolate was Trichophyton rubrum. It was the causative agent in about 26 (46%) patients. Out of them 3 had diabetes mellitus, 2 had Bronchial Asthma and 1 had distal subungual onychomycosis. Trichophyton rubrum (Figure 4) was the isolate in the patient with erythroderma like extensive dermatophytosis. The next frequent isolate was Trichophyton mentagrophytes. It was isolated in 9 (34.6%) patients. Of them, 3 had bronchial asthma with history of long term systemic steroids. 2 had diabetes mellitus. The other isolates were Trichophyton tonsurans (2), Trichophyton violaceum (1), Trichophyton simii (1), and Trichophyton verrucosum (1) (Figure 5). Trichophyton verrucosum was isolated from a HIV infected patient from rural area with history of contact with cattle. He had non-inflammatory type of extensive dermatophytosis.

Table -4: Agents isolated in chronic dermatophytosis patients

S.No.	Agent	No. of Patients
1	Trichophyton rubrum	26
2	Trichophyton mentagrophytes	9
3	Trichophyton tonsurans	2
4	Trichophyton violaceum	1
5	Trichophyton verrucosum	1
6	Trichophyton simii	1

Maximum isolates of Trichophyton rubrum were obtained in age group of 40 – 50 years. Trichophyton mentagrophytes was observed to be common in the females. The maximum numbers of agent isolation were done in the 30 – 50 years age groups. About 34 (56.6%) patients were observed to have eosinophilia with their absolute eosinophil count more than 450 cells / mm3. Among them 11 patients had diabetes mellitus and 6 patients had bronchial asthma.

Figure 4: Trichophyton rubrum, cottony white colony with red reverse

Figure 5: Trichophyton Verrucosum, gray colored colonies

Discussion

In this study, the most affected age group was 30 to 40 years and the mean age was 47.8 years. Males were more affected in this age group. But most of the females were of 50 to 60 years age. This finding is consistent with that of a previous study conducted in our department where males were mostly affected in third decade and females in fourth to fifth decade of life. Their mean incidence of age was 39 years. [3] Females outnumbered males in the present study. The male: female ratio was 1: 1.5. This is in contrast to earlier studies where males were predominantly affected [3], [4], [5]. But female preponderance has been noted occasionally. Diabetes mellitus was the most frequent systemic association noted in this study. This is similar to the findings of some of the earlier studies [6]. But in certain studies of diabetes mellitus, neither increased prevalence of dermatophytosis nor any correlation between dermatophytosis and duration of diabetes have been noted[7], [8]. Bronchial asthma was the next common disease associated with chronic dermatophytosis in this study. Similar observation was made in atopic with chronic dermatophytosis infection [4], [9]. It has been found in certain studies that absorption

of fungal allergen leads to bronchial hyperactivity and late onset intrinsic type asthma [10]. Atopy also can be exacerbated by chronic dermatophytosis because of the trichophytin hypersensitivity which is known as atopic – chronic – dermatophytosis syndrome. Few cases of bronchial asthma were found to be associated with hypothyroidism and diabetes mellitus. Most of these bronchial asthma patients were on long term systemic steroids. In many instances of chronic infection, long term steroids have been an associated factor. Immunosuppressed states like HIV infection, Systemic lupus erythematous and renal transplantation were noted in this study. Few cases of treatment failure were also observed. All these factors contribute to chronicity as noted in previous studies [11], [2].Tinea corporis and tinea glutealis were the frequently observed clinical types in this study. Waist in women and back in men were the commonest sites affected as noted in previous studies.

Tinea cruris was common in males while tinea axillaris was more in females. This type of presentation can be attributed to the dressing pattern of the patients in this region. Occlusive dressing especially with synthetic clothes have always been considered as an important contributory factor due to the excessive sweating and moisture resulting in high humidity and CO2 level [12]. In tinea cruris, hypersensitivity to trichophytin antigen plays a role in pathogenicity [13]. Tinea corporis was the commonest presentation in diabetes mellitus patients. About 78% of the study cases had multiple site involvement. Tinea unguium was noted in some of them. This could be a cause for the chronic multiple site infection as noted in certain studies [4]. Distal lateral subungual type of Tinea unguium was noted in most of the patients. One of the HIV infected patients had proximal subungual white onychomycosis. This is the most common type of nail tinea unguium seen in HIV infection. Recurrent tinea unguium is usually found to be due to early termination of treatment, poor penetration of antifungal into the nails and underlying concomitant diseases. One patient with bronchial asthma on long term steroids use had erythroderma like tinea corporis. Similar widespread, non inflammatory, resistant type of infections is usually noted in immunosuppressed states like HIV infection and renal transplant patients [14], [15], [4]. Trichophyton rubrum was the most frequent isolate in this study. It was the causative of the erythroderma like tinea corporis observed in this study. Trichophyton rubrum usually causes widespread non inflammatory lesion. This organism has been the commonest isolate in most of the previous studies [16],[2]. Trichophyton mentagrophytes was the second commonest isolate as observed in earlier studies [17]. Trichophyton verrucosum was isolated from a HIV patient from rural area. It usually causes inflammatory type of dermatophytosis. But in this patient extensive non-inflammatory type of dermatophytosis was observed. Similar observation has been made previously in one study [17].

Eosinophilia with absolute eosinophil count more than 450 cells mm^3 was noted in 56% of the study patients. Most of them had Diabetes and bronchial asthma. Eosinophilia along with elevated IgE has been reported to be associated with chronic dermatophytosis. [18], [19].

A similar study of chronic dermatophytosis by Prasad et al revealed factors like onychomycosis, body surface area of involvement, prolonged sun exposure and diabetes mellitus were responsible for the chronicity of dermatophytosis [20].

Conclusion

Even though our study could identify the association of diabetes and asthma, more research is needed to find out more factors for the chronicity of dermatophytosis.

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