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# SOME ASPECTS OF DERMATOPHYTOSES SEEN AT UNIVERSITY HOSPITAL IN FLORIANÓPOLIS, SANTA CATARINA, BRAZIL

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## SUMMARY

Dermatophytoses comprise mycoses which are very frequently diagnosed in the routine of clinical laboratories of Florianópolis, like any other Brazilian cities. However, no clinical or epidemiological studies data have been published for that city so far. To partially clarify these questions, we carried out a study on this subject on patients who sought the mycology services of Hospital of Federal University of Santa Catarina, from January 1995 to November 1996. The most prevalent dermatophyte was *Trichophyton rubrum* (58.6%), followed by *T. mentagrophytes* (25.3%), *Epidermophyton floccosum* (7.2%), *Microsporum canis* (4.8%), *T. tonsurans* (1.6%) *T. violaceum* (1.6%) and *M. gypseum* (0.8%). The prevalence of *T. mentagrophytes* was significantly higher for females than for males, with a frequency of 37.3% and 16.0% respectively, which could be explained by higher infection of *T. mentagrophytes* in feet and nails, which were percentually more affected in females than in males. These results suggest that, in general, the clinical and epidemiological characteristics of dermatophytoses of our study have similar patterns of those occurring in other southern and southeastern Brazilian cities.

**KEY WORDS**: Dermatophytoses; Dermatophytes; Epidemiology; Brazil.

## INTRODUCTION

The dermatophytoses, commonly referred to as "*ringworms*" or "*tineas*", comprise mycoses caused by a group of related fungi, called dermatophytes, which have the capacity to invade keratinized tissue of human and other animals[1,3,9,18]. The infection is generally cutaneous and restricted to the nonliving cornified layers, and sites most frequently affected are feet, nails, groins, globrous skin and scalp[1,3,4,18,23]. These fungi have worldwide distribution and about 11 species, belonging to the genera *Epidermophyton, Microsporum* and *Trichophyton*, are presently known to be infecting to the human being[18,23]. The kind of lesion and the site affected by them cannot be related to a determined species since it has been observed that different dermatophytes may produce clinically identical lesions, and a single species may infect many anatomic sites[1, 18, 23].

As widely reported, most cases of dermatophytoses in Brazil are caused by *Trichophyton rubrum, Trichophyton mentagrophytes, Epidermophyton floccosum* and *Trichophyton tonsurans*, although other species such as *Microsporum canis* and *Microsporum gypseum*, are also reported[5, 10-11, 20, 22]. On the other hand, species once epidemiologically important, such as *Trichophyton violaceum* and *Trichophyton schoenleinii*, are very rare or almost extinct today[2, 13, 18], and regional variations in the species of predominantly causative agents are observed[5-8, 14, 19].

In Florianópolis, the professionals involved in clinical and laboratory mycological routine know very well how frequently dermatophytes are implicated in superficial mycoses. However, evaluations of their clinical and epidemiological data are lacking, and as consequence many aspects of those mycoses are not known or very restricted for that city. Thus, in order to obtain informations on this matter, we carried out an evaluation of cases of dermatophytoses diagnosed from 1995 to 1996, at the Federal University of Santa Catarina Hospital (HU).

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## MATERIALS AND METHODS

### Samples

From January 1995 to November 1996, we evaluated 946 mycosis-suspected ambulatory patients living in Florianópolis and nearby cities who sought the mycology laboratory of HU. Of these, a total of 249 patients, with dermatophytosis, were evaluated in this study. Patient's records such as data of age, gender and anatomic site of mycotic lesions were collected during that period.

### Laboratory procedures

The diagnosis of dermatophytoses were carried out by direct microscopy (DM) and culture of cutaneous material obtained from patients. For DM the samples were microscopically examined after treatment with 10% concentration hydroxide potassium for skin and hair and 30% concentration for nails. The cutaneous materials were placed on slant tubes of Sabouraud's dextrose agar containing chloramphenicol and cycloheximide and incubated at room temperature for up to four weeks. Identification of positive cultures was made by observation of gross colony characteristics and lactophenol-cotton blue microscopic examinations.

### Statistical analysis

A 95% confidence qui-square test ($x^2$) was utilized for evaluation of the association between the variables of gender, frequency of *T. rubrum* and *T. mentagrophytes* and anatomic sites of lesion.

## RESULTS

Of the patients studied, 138 (55.6%) were male and 110 (44.4%) were female, with ages varying from zero to 19 years in 25.6% and above 19 years in 74.4% of patients. In one patient, the gender was not recorded. In addition, we could not correlate the site of lesions of dermatophyte species frequencies with patient's age, as in 120 of them the age was not recorded. When we evaluated the frequency of the anatomic sites affected, we found that the most affected site were feet (33.1% of cases), nails (19.1%) and groin/buttocks (18.8%, table 1). Other sites affected were hands/arms (7.7%), legs (6.6%), trunk (5.7%), face/neck (4.2%), and scalp (4.2%). In several patients, more than one site was affected. When the prevalence of dermatophytes on the sites of lesions were evaluated. *T. rubrum* had an almost steadly distribution for all sites (Table 1). On the other hand, a low prevalence of *T. mentagrophytes* and high prevalence of *E. floccosum* in groin/buttocks could be observed (Table 1). The other dermatophytes were in too small numbers to give any useful information.

As shown in table 2, *T. rubrum* was diagnosed in 146 patients (58.6%), followed by *T. mentagrophytes* in 63 (25.3%). Other dermatophytes isolated were *E. floccosum* (7.2%), M. canis (4.8%), *T. tonsurans* (1.6%). *T. violaceum* (1.6%) and *M. gypseum* (0.8%). When the prevalence of *T. rubrum* and *T. mentagrophytes* was compared between genders, it was found that *T. rubrum* was diagnosed in 65.9% of males and 49.1% of females. When the same evaluation was made for *T. mentagrophytes*, a statistically significant difference for the prevalence of 16.0% in males and 37.3% in females was found (Table 3, p = 0.0004, 95% confidence interval). To see if different lesion pattern distributions between genders could explain distinct prevalence of *T. mentagrophytes*, we compared anatomic sites affected by dermatophytes in male and female patients. As shown in Table 4, prevalence of most affected sites (nails and groin/buttocks), were 28.5%, 15.2% and 24.8% for male patients and 39.3%, 24.6% and 10.7% for female patients, respectively. The only statistically significant difference observed was for groin/buttocks, in which this site was affected much more in male than in females (p = 0.0017, 95% interval confidence).

## DISCUSSION

Several studies have shown that the dermatophytes constitute the most frequent etiologic agents of superficial mycoses diagnosed on the routines of clinical laboratories[4, 7, 10]. However, the different species of this fungi group have unequal frequencies, with variations of their prevalence according the country or regions of the same country[6-8, 11, 14, 18-19, 21, 24]. In our study, about seven dermatophyte species were isolated in the HU laboratory, and *T. rubrum* and *T. mentagrophytes* were the most prevalent species, followed by *E. floccosum*, *M. canis*, *T.*

**TABLE 1**
Distribution of dermatophyte species according to the site of lesion *

| Species / Site of lesion | Total and prevalence | *T. rubrum* | *T. mentagrophytes* | *E. floccosum* | *M. canis* | *T. tonsurans* | *M. gypseum* | *T. violaceum* |
|---|---|---|---|---|---|---|---|---|
| Feet | 95 (33.1%) | 51 | 36 | 05 | 03 | 00 | 00 | 00 |
| Nails | 55 (19.1%) | 41 | 12 | 02 | 00 | 00 | 00 | 00 |
| Groin/Buttocks | 54 (18.8%) | 37 | 04 | 09 | 02 | 01 | 01 | 00 |
| Hand/arms | 22 (7.7%) | 16 | 05 | 01 | 00 | 00 | 00 | 00 |
| Legs | 19 (6.6%) | 15 | 01 | 01 | 02 | 00 | 00 | 01 |
| Trunk | 16 (5.7%) | 08 | 02 | 02 | 03 | 01 | 01 | 00 |
| Face/neck | 12 (4.2%) | 11 | 00 | 00 | 01 | 00 | 00 | 00 |
| Scalp | 12 (4.2%) | 00 | 04 | 00 | 03 | 02 | 01 | 02 |
| Total | 287 (100.0%) | 179 | 64 | 20 | 14 | 04 | 03 | 03 |

* In some patients dermatophyte species were isolated from more than one site.

**TABLE 2**
Prevalence of dermatophyte species isolated from HU patients, 1995-1996

| Dermatophyte | Number | Percentage |
|---|---|---|
| *T. rubrum* | 146 | 58.6% |
| *T. mentagrophytes* | 63 | 25.3% |
| *E. floccosum* | 18 | 7.2% |
| *M. canis* | 12 | 4.8% |
| *T. tonsurans* | 04 | 1.6% |
| *T. violaceum* | 04 | 1.6% |
| *M. gypseum* | 02 | 0.8% |
| Total | 249 | 100.0% |

**TABLE 3**
Distribution of *T. rubrum* and *T. mentagrophytes* according to the gender of patients*

| Dermatophyte | Male | Female | Total |
|---|---|---|---|
| *T. rubrum* | 91 (65.9%) | 54 (49.1%) | 145 |
| *T. mentagrophytes* | 22 (16.0%) | 41 (37.3%) | 63 |
| Other dermatophytes | 25 (18.1%) | 15 (13.6%) | 40 |
| Total | 138 (100.0%) | 110 (100.0%) | 248 |

* In one case of *T. rubrum* infection the gender of patient was not recorded.

**TABLE 4**
Distribution of site of lesion according to the gender of patients

| Site of lesions | Male | Female | Total |
|---|---|---|---|
| Feet | 47 (28.5%) | 48 (39.3%) | 95 |
| Nails | 25 (15.2%) | 30 (24.6%) | 55 |
| Groin/buttocks | 41 (24.8%) | 13 (10.7%) | 54 |
| Other sites | 52 (31.5%) | 31 (25.4%) | 83 |
| Total | 165(100.0%) | 122(100.0%) | 287 |

* In some patients more than one site of lesion was affected

*tonsurans, T. violaceum* and *M. gypseum.* Several authors have reported not only a predominance in the number of cases caused by *T. rubrum*, but an significant increase in its prevalence over time [5-7, 10, 12, 16].

In respect of prevalence of each dermatophyte species, we observed that species like *M. canis, M. gypseum, T. tonsurans* and *T. violaceum*, presented a low prevalence, while others like *T. schoenleinii*, were not detected. Reports from some studies carried out in southern and southeastern Brazil have shown that *T. violaceum* e *T. schoenleinii* have almost disappeared, since they formerly occurred in familiar clusters of people that immigrated from Europe, which today are not common in our country[5, 11-12]. But, the increase in the number of cases of *T. violaceum* we have observed in 1995 and 1996 (data not shown), indicates that some foci still remains. To follow-up the prevalence tendencies for this species would take us a longer study period. Other species, *T. tonsurans,* has a relatively low prevalence in southern of Brazil, with most cases occurring in immigrants from northern or northeastern regions of Brazil, where high prevalences for this dermatophyte has been reported[4,6,8,17]. Unfortunately, we could not determine whether the *T. tonsurans* patients of our sample came from that Brazilian regions. Although we could not correlate prevalence of dermatophytes and patient's ages, most of them were adults with ages above 20 years. It has been shown that older patients are predominantly infected by T. *rubrum, T. mentagrophytes var. interdigitale* and *E. floccosum*[3]. This explains the fact that *M. canis*, once one of the most frequent species, presented low prevalence rates in our sampling, since today it generally infects children who make contact with infected domestic pets like cats and dogs[10-11, 16]. *M. gypseum*, on the other hand, seems to have a lower prevalence, occurring only when the infection is caused by virulent strains, or when the soil is heavily contaminated by fungi spores or the host has low resistance or previous lesion[20].

Clinical studies have demonstrated that different dermatophyte species may cause similar lesions while single species may cause a wide range of clinical manifestations,[1, 9, 18, 21, 23]. For example, *T. rubrum* may cause almost all kinds of lesions and occur in almost all anatomic sites, as *E. floccosum* are found mainly in intertriginous areas, nails and trunk, but not the scalp[15, 18, 23], and *M. canis* occurs in scalp and glabrous skin[16,22]. We observed a lack of infection of scalp by *T. rubrum* and a low prevalence of *T. mentagrophytes* on the groin/buttocks which were generally similar to those reported in the literature[15,18]. Also, we observed that this latter site was found to be affected more frequently in male than in female patients. It is known that the dermatophyte lesions in inguinal, genital and perianal regions are more prevalent in males, because they use more tightened clothes, with consequent maceration and also the site is obstructed by scrotum[3,15,18,23]. We think that the observed cumulative prevalence of *T. mentagrophytes* in feet and nails could have accounted for the higher prevalence of this dermatophyte in female than in male patients.

In conclusion, our data have shown a predominance of *T. rubrum* over other dermatophytes, suggesting that, like almost every other place where dermatophytoses are diagnosed, *T. rubrum* is the probable major etiologic agent of dermatophytoses in Florianópolis.

In addition, a preponderant affection of feet and nails as the prime site leading patients to sought medical aid has been observed. These results suggest that, in general, the clinical and epidemiological characteristics of dermatophytoses seen at HU have similar patterns of those observed in other southern and southeastern Brazilian cities.

## RESUMO

### Aspectos clínico-epidemiológicos das dermatofitoses diagnosticadas no Hospital Universitário de Florianópolis, Santa Catarina, Brasil.

As dermatofitoses constituem uma das micoses mais freqüentemente diagnosticadas nos laboratórios clínicos. Tendo

em vista que o perfil clínico-epidemiológico das dermatofitoses em Florianópolis não é conhecido, procuramos avaliar informações a respeito desse assunto, por meio de um estudo em pacientes que procuraram o serviço de micologia do laboratório de Análises Clínicas do Hospital da Universidade Federal de Santa Catarina (HU), no período de janeiro de 1995 a novembro de 1996. A espécie diagnosticada com maior prevalência foi o *T. rubrum* (58,6%), seguida pelo *T. mentagrophytes* (25,3%), *E. floccosum* (7,2%), *M. canis* (4,8%), *T. tonsurans* (1,6%), *T. violaceum* (1,6%) e *M. gypseum* (0,8%). Foi observada uma prevalência maior do *T. mentagrophytes* em pacientes do sexo feminino (37,3%) em relação aos pacientes do sexo masculino (16,0%), o que pôde ser explicado por uma prevalência relativamente alta do *T. mentagrophytes* nos pés e nas mãos, os quais foram percentualmente mais afetados em mulheres do que em homens. Estes resultados sugerem que, de maneira geral, as características clínicas e epidemiológicas das dermatofitoses observadas em nosso estudo são similares àquelas encontradas em outros realizados em cidades da região sul e sudeste do país.

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