Rev. Inst. Med. trop. São Paulo
12(5):339-342, setembro-outubro, 1970

UDC 616.992

A TEN-YEAR SURVEY OF THE CUTANEOUS MYCOSES IN THE STATE OF RIO GRANDE DO SUL (BRASIL). I — DERMATOPHYTOSES

A. T. LONDERO [1], Cecy D. RAMOS [2] and J. S. LOPES [3]

SUMMARY

A survey of the dermatophytoses in the hinterland of the southernmost state of Brasil, made during 1960-1969, disclosed seven dermatophytes as the etiologic agents in 1019 cases of ringworm. Changes in the relative frequency of the dermatophyte species were found. The prevalence of the species and their distribution according to clinical site were described.

INTRODUCTION

During the period of 1960-1969 investigations were carried out on human ringworm infections in the hinterland of the State of Rio Grande do Sul, Brasil [1, 3, 4, 6, 7]. These investigations dealt with two groups of patients: 1) those living in the county of Santa Maria and 2) occasional patients coming from the surrounding counties. The first group was the largest and the most homogeneous. It was made up of patients routinely referred to our service for mycologic diagnosis. This group well represented the various social strata found in the state's population *.

In this part of our survey we present a ten-year panoramic view of the prevalence of the dermatophytes and a discussion of some mycologic aspects of the tinea infections of the people of Santa Maria, Rio Grande do Sul, Brasil.

MATERIAL AND METHODS

During the study period (1960-1969) 1019 patients with tinea infection were referred to us for mycologic diagnosis by the dermatologic service of the School of Medicine and by private physicians.

Infected hair was examined in 10% potassium hydroxide. Scrapings of skin and nail were fixed and stained with Giemsa's stain. Cultures were made on Sabouraud's glucose agar with cycloheximide and chloramphenicol. Subcultures on fresh Sabouraud's medium and the hair penetration tests were carried out to identify the various dermatophytes.

RESULTS

Fungus elements were detected by direct microscopic examination of hair and skin scrapings in all 1019 patients. In 1004 of the specimens only hyphae of dermatophytes were found. In 15 specimens dermatophyte mycelium plus hyphae of *Candida* sp. and/or elements of *Corynebacterium minutissimum* were found associated in the same lesion. The etiologic agents were isolated and iden-

Trabalho do Instituto de Parasitologia e Micologia da Universidade Federal de Santa Maria, Rio Grande do Sul, Brasil
(1) Professor Titular
(2) Bolsista do Conselho Nacional de Pesquisas (CNPq), Pesquisadora
(3) Auxiliar de Ensino

* Santa Maria is the most central county in the State of Rio Grande do Sul. It has 4.1% of the state's population and it has been exposed to migratory currents of people coming from surrounding counties on account of its educational facilities.

tified in 885 cases. In 134 specimens cultures for dermatophytes * were negative.

The classification of dermatophytes according to their relative occurrence and their comparative affinities for various sites of the body are presented in Table I. The annual frequency of the species isolated are presented in Fig. 1.

TABLE I

Dermatophytoses in Santa Maria (Rio Grande do Sul, Brasil). Record of infections by species and by body sites

Dermatophytes isolated in order of frequency	Site of infection						Total	%
	skin	scalp	feet	nails	beard	groin		
Trichophyton rubrum	58	2	43	35	3	168	309	34.9
Microsporum canis	151	131	—	—	—	—	282	31.9
T. mentagrophytes	31	9	74	5	9	22	150	17.1
Epidermophyton floccosum	9	—	26	1	—	66	102	11.5
T. verrucosum	26	3	—	—	—	—	29	3.2
M. gypseum	7	2	—	—	—	—	9	1.0
T. schoenleinii	—	4	—	—	—	—	4	0.4
Total	282	151	143	41	12	256	885	100.0

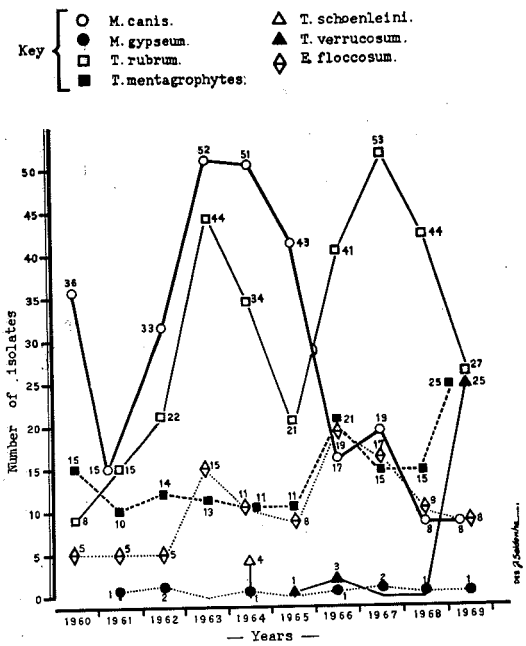

Fig. 1 — Annual frequency of the species of dermatophytes isolated during 1960-1969 period, in Santa Maria, Rio Grande do Sul, Brasil

DISCUSSION

Seven species of dermatophytes were isolated. They were: *Epidermophyton floccosum, Microsporum canis, M. gypseum, Trichophyton mentagrophytes, T. rubrum, T. schoenleinii,* and *T. verrucosum. T. rubrum* was the predominant species.

The relative frequency of the species isolated and the dominant agent changed during the 10-year observation period. Between 1960-1964, *M. canis, T. rubrum, T. mentagrophytes, E. floccosum, T. schoenleinii* and *M. gypseum* were isolated in that order of frequency. In that period *M. canis* was the dominant species. Between 1965-1969, *T. verrucosum* infections were first diagnosed and *T. schoenleinii* infection were no longer encountered. In addition *T. rubrum* replaced *M. canis* as the dominant species.

* In 30% of these cases a *Candida* sp. (usually *C. albicans*) was recovered in culture, but the typical hyphae of a *Candida* sp. could not be found by microscopic examination of the clinical material.

During the 10-year study period 309 *T. rubrum* (34.9%) isolates were obtained. As to the body areas affected, it has had the widest distribution. It was the most common agent of *Tinea cruris* and the groin was the most frequently parasitized site (Table I). It was also isolated from cases of *tinea corporis*, *t. pedis*, *t. unguim*, *t. barbae* and *t. capitis*, in that order of frequency. Multiple lesions that covered large areas of the skin were commonly observed. When scalp and bearder areas were infected, Kerion-like lesions developed. In these cases the fungus did not parasitize hair. All but eleven of the patients infected by *T. rubrum* were adolescents and adults. Almost all of the *T. rubrum* infections occurred in patients living in urban areas.

M. canis, the next dermatophyte in order of frequency, was isolated from 282 (31.9%) patients. It had been the most frequently isolated dermatophyte prior to 1966. After that year a decrease in its incidence was noted. It usually was found to be the agent of epidemics in urban areas. Cats were the source of such infections [2]. *M. canis* was recovered from scalp and skin. Multiple lesions generally developed in these cases. All but thirty of the patients were children.

T. mentagrophytes, the third most prevalent dermatophyte, was isolated from 150 (17.1%) patients. It was the most common etiologic agent of *Tinea pedis*. In order of frequency it parasitized the skin, groin scalp and beard. A case of *tinea barbae* with verrucous lesions was described a few years ago [5]. *Tinea pedis* and *t. cruris* usually were caused by the cottony type of *T. mentagrophytes*. *Tinea corporis*, *t. capitis* and *t. barbae* were almost always caused by *T. mentagrophytes* of the powdery type. Kerion-like lesions on the scalp and beard were the rule. All but seventeen patients were adults. All of the cases among children were caused by *T. mentagrophytes* var. *granulare*. Their lesions were on the skin and scalp.

E. floccosum was isolated from 102 (11.5%) clinical specimens. It was recovered from the groin, feet, body and nails, in that order of frequency. All but seven of the patients were adults.

T. verrucosum was the cause of 29 (3.2%) ringworm infections. It was isolated once in 1965, three times in 1966 and 25 times in 1969. Growth of the dairy industry in Rio Grande do Sul explains the rise in frequency of *T. verrucosum* infections. It was isolated from lesions on the skin and scalp. Kerions of the scalp and circinata lesions on the skin were the usual clinical developments.

M. gypseum was isolated 9 times (1.1%) from skin and scalp lesions. Its appearance was sporadic. Kerion-like lesions were usually seen. All but one of the patients were children who lived in urban areas.

T. schoenleinii was isolated in 1964 from four children in one family who had come from the county of Jaguary. In that county favus infections was known to be endemic [1].

Direct examination of skin and nail scrapings stained with the Giemsa stain permitted easy detection of mycelial elements in clinical material. This stain was of great value, especially with specimens that had few fungus elements. Fifteen of our cases had interesting mycologic features. Two different fungi, one or two fungi associated with *Corynebacterium minutissimum* were found in scrapings from the same lesion. In thirteen cases, both a *Candida* species and a dermatophyte or *C. minutissimum* were seen on direct examination. In two cases, a *Candida* species, a dermatophyte and *C. minutissimum* were detected on direct examination. The distribution of these cases according the site of infection are presented in Table II.

TABLE II

Association of agents in the same clinical lesion

no. of cases	Site of infection	Associated agents
4	toe webs	*Trichophyton mentagrophytes — Candida albicans*
1	toe webs	*T. mentagrophytes — Corynebacterium minutissimum*
1	toe webs	*Epidermophyton floccosum — C. minutissimum*
1	toe webs	*E. floccosum — C. albicans*
1	toe webs	*Trichophyton rubrum — C. albicans*
1	toe webs	*T. rubrum — C. albicans — C. minutissimum*
2	groin	Dermatophyte — *C. albicans*
1	groin	Dermatophyte — *C. minutissimum*
1	groin	*E. floccosum — C. albicans*
1	groin	Dermatophyte — *C. albicans — C. minutissimum*
1	nail	*T. rubrum — C. albicans*

RESUMO

Um inquérito de dez anos sôbre micoses cutâneas no Estado do Rio Grande do Sul (Brasil).

I — *Dermatofitoses*

O levantamento das dermatofitoses no interior do Estado do Rio Grande do Sul (Brasil), feito no período de 1960 a 1969, demonstrou que sete dermatófitos foram os agentes etiológicos de 1019 casos de "tinha" humana. É comentada a modificação do espectro dos dermatófitos e a variação da espécie predominante. É assinalada a prevalência anual das espécies e a sua distribuição de acôrdo com a afinidade pelas várias regiões do corpo.

ACKNOWLEDGEMENTS

Our sincere appreciation is expressed to Dr. Libero Ajello from the N. C. D. C., Atlanta (USA), for his thoughful criticism and English correction of the manuscript.

REFERENCES

1. FISCHMAN, O.; FABRICIO, R.; LONDERO, A. T. & RAMOS, CECY D. — A tinha fávica no Rio Grande do Sul (Brasil). *Rev. Inst. Med. trop. São Paulo* **5**:161-164, 1963.
2. LONDERO, A. T.; FISCHMAN, OLGA & RAMOS, CECY D. — Importância do gato na transmissão do *Microsporum canis*, no Rio Grande do Sul (Brasil). *Rev. Inst. Med. trop. São Paulo* **3**:81-84, 1961.
3. LONDERO, A. T.; RAMOS, C. D. & LAUDA, P. — Os dermatófitos no interior do Rio Grande do Sul. *Hospital* (Rio) **61**:161-165, 1962.
4. LONDERO, A. T. — Dermatomycosis in the hinterland of Rio Grande do Sul (Brazil). *Derm. Internat.* **3**:64-68, 1964.
5. LONDERO, A. T. — Tinha da barba de forma verrucosa. *Rev. Fac. Farm. Santa Maria* **10**:1-2, 1964.
6. LONDERO, A. T. — Alguns aspectos das micoses no interior do Rio Grande do Sul. *Rev. Fac. Farm. Santa Maria* **12**:63-76, 1966.
7. LONDERO, A. T. & FISCHMAN, O. — Epidemia de tinha por *Trichophyton verrucosum*. *Rev. Brasil. Pesq. Med. Biol.* **2**:241-244, 1969.

Recebido para publicação em 22/4/1970.