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CLINICAL ARTICLES

A STUDY ON THE TRICHOPHYTON SIMII INFECTIONS IN MAN AT DELHI

By

D. N. MULAY and A. K. GARG

Pinoy[1,2] in 1912 isolated a fungus from the skin lesions of a monkey and placed it under the genus *Epidermophyton* as *E. simii*. The same fungus was later on placed in a monotypic genus, *Pinoyella* by Castellani and Chalmers[3] (1919). Duncan[4] (1929) successfully isolated Pinoy's fungus from monkeys and for the first time placed the fungus in the genus *Trichophyton* as *T.simii*. However, Duncan failed to make a valid publication of his new combination and it was Stockdale[5] *et al.* who for the first time made a valid publication and placed Pinoy's fungus in *Trichophyton* as *T. simii*. It was interesting to note that all the 31 isolates studied by Stockdale *et al.* had originated from India and were isolated from the ringworm infections of monkeys, poultry, dog and a man. The clinical appearance of the disease was for the first time described in a paper published from the Willingdon Hospital[6] in 1967 and since then, it has also been reported to have been isolated by various workers[6,8,7] from other sources like soil, fur of small mammals and feathers.

MATERIAL AND METHOD

3188 skin and nail scrapings and hair from patients suspected to be suffering from dermatophytosis were examined at the skin O.P.D. of the Willingdon Hospital, New Delhi during the years 1965-69. Routine microscopic examination of these materials in KOH preparations was done and the fungi were isolated by culturing a portion of these materials on routine Sabouraud's isolation medium also containing chloramphenicol and cyclohexamide. The well known hair-baiting technique was used for the isolation of dermatophytes from soil. For isolation of fungi from feathers and combs, these materials were placed in small moist chambers of sterilised Petri-dishes and incubated at 25–28°C.

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(Department of Dermatology, Willingdon Hospital, New Delhi)

RESULTS

Out of 3188 specimens examined during last five years i. e. 1965 to 1969 at Willingdon Hospital, 1124 isolates of dermatophytes were obtained.

TABLE 1

Showing the relative incidence of different dermatophytes isolated during 1965 to 1969.

Species of dermatophytes	1965 1966	1967	1968	1969	Total	Percentage for each species
Total scrapings	750	1182	600	456	3188	
Total cultures obtained	305	307	249	263	1124	35.2
Trichophyton rubrum	256	271	239	235	1001	88.8
T. simii	12	8	4	6	30	2.6
T. mentagrophytes	23	11	2	3	39	3.4
T. tonsurans	1	9	–	1	11	0.97
T violaceum	2	2	–	1	5	0.44
Epidermophton floccosum	10	6	4	17	37	3.2
Microsporum gypseum	1	–	–	–	1	0 08

Table 1 shows the incidence of the various species of dermatophytes isolated during the study. *T. rubrum* was found to be the most predominant species forming 88 8% of the fungi isolated. *T. simii.* which has lately been found to be an important species causing dermatophytosis in man and animals in India, was found to have an over all incidence as high as 2 6%. The recovery of this dermatophyte was quite high when we compare it with the recovery of the other better known species from India, viz. *T. tonsurans* (0.97%), *T. violaceum* (0.44%) and *Microsporum gypseum* (0.08%). In its incidence this species came next only to *T. rubrum* (88 8%) *T. mentagrophytes* (3.4%) and *Epidermophyton floccosum* (3.2%).

TABLE 2

Age and distribution in 23 cases suffering from T. SIMII infections

Sex	AGE GROUPS IN YEARS								Total nos	Percentage
	Less than one	1–9	10–19	20–29	30–59	40–49	50–59	60–69		
Male	–	2	5	4	3	2	–	1	17	73.9
Female	1	–	–	1	3	1	–	–	6	26.1

T. simii infections were found to be common in both sexes with males (73.9%) outnumbering females (26.1%) (Table 2). These infections were found in all age groups ranging right from one month old baby girl to a 65 years old man.

However, people in the age groups in between 10 to 40 years were found to be the most susceptible ones. Tinea corporis was the commonest (65.2% out of 23 patients) of *T. simii* infection encountered (Table 3). This was followed by tinea cruris (34.7%), tinea capitis (21.7%) tinea pedis (8.6%) and tinea barbae (4.3%). Tinea corporis, tinea cruris and tinea pedis caused by *T. simii* were common amongst adults. Tinea capitis infections on the other hand were restricted to children below the age of 20 years only.

TABLE 3

Age and sex distribution in relation to site of lesion involved in 23 cases infected with T. SIMII

Site of lesion	Less than one		1–9		10–19		20–29		30–39		40–49		50–59		60–69		Total nos	Percentage
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F		
Tinea corporis	–	–	–	–	3	–	2	1	2	3	2	1	–	–	1	–	15	65 2
Tinea cruris	–	–	–	–	3	–	3	–	–	–	1	1	–	–	–	–	8	34.7
Tinea pedis	–	–	–	–	–	–	1	–	1	–	–	–	–	–	–	–	2	8 6
Tinea capitis	–	1	2	–	2	–	–	–	–	–	–	–	–	–	–	–	5	21.7
Tinea barbae	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	4.3

TABLE–4.

Distribution of sites of lesions produced by T. simii

Site of lesion	NUMBER OF CASES	
	Age less than 20 year	Age 20 year or more
Scalp	5	–
Lower abdomen	1	4
Groins	3	5
Penis	1	–
Cheek	1	–
Arm	1	2
Planter surface	–	2
Axilla	–	2
Thighs	–	2
Buttocks	–	2
Waist	–	2
Toes	–	1
Back	–	1
Elbow	–	1
Chest	–	1
Beard	–	1

It is clear from Table 4 that any part of the body could be infected by the fungus. However in general, the most common sites infected by this species were groins and lower abdomen. The lesions on the other parts of the body were seen to a less extent.

CEINICAL OBSERVATIONS

The clinical mainfestations in tinea corporis and tinea cruris caused by *T. simii* were more or less similar. The lesions were either single or multiple, circular or circinate, dry, scaly, mostly flat but may be raised a little sometime and mostly hyperpigmented. The itching in all these two types of tineas was moderate to severe. In tinea pedis infections macerated lesions in between the toes and dyskeratotic lesions on the planter surface of feet were observed. Itching in these was also from moderate to severe. It was interesting to note that all the cases of tinea capitis and tinea barbae caused by *T. simii* formed a kerion. In all the patients there was mostly a single lesion which was boggy and raised. Thin seropurolent discharge was observed in some of the case. Loose hair could be epilated easily from these lesions. Patients did not complain of itching.

While it is neither desirable nor possible here to give an account of all the cases of *T. simii* observed during this study, it would, however, be worth while to mention two cases where the fungus was isolated not only from the lesions but also from extra-human saprophytic sites in their houses.

The first case was of a medical student who came for treatment of tinea cruris infection in 1967. The KOH preparation was positive and the culture proved to be that of *T. simii*. On query, the patient reported the presence of birds nest in the house. The patient was requested to bring the feathers for mycological study and was prescribed griseofulvin 2 bd pc for 15 days. Unfortunately, the patient did not turn up that year at all. The same patient returned after a year with the same lesion and admitted that he had taken griseofulvin for only 10 days which gave him relief and hence did not continue the treatment He, however, brought some feathers for mycological study. The scrappings from the lesions of the patient again showed the growth of *T. simii* on culture. The feathers were cultured and one of the feather showed fungus growth which was identified as *T. simii*.

In the second case, we observed a family of 4 having tinea lesions. The father came along with one son to the OPD. He had a patch on the chest (Fig. 1) which was circular, dry, slightly scaly, raised and little hyperpigmented. He had a second lesion on the chin which was a kerion. The son had a kerion lesion at the scalp and a typical ringworm lesion in the groin and on the face. The microscopic examination of the hair and skin scraping from all the lesions both in father had the son showed fungal elements. On culture, *T. simii* was identified from all the materials cultured except from the beard region of the father. At the next visit, the father brought two other sons who also showed the lesions. One of them had

a kerion on the scalp and the second had a single ringworm lesion on the left arm. A visit to the house of this family revealed that no other family member had any tinea lesions and on enquiry it was found that there was nobody in the neighbouring houses who had the lesions.

The eldest son was the first to have the infection and in a span of just 5-6 days, the other 3 members got the lesions. Soil samples and feathers from the house alongwith the combs used by them were brought to the laboratory for further examination. *T. simii* was isolated from one of the soil samples but we could not isolate this fungus from the other materials brought for the examination. The other fungus isolated along with *T. simii* from the same soil sample was *M. gypseum.*

Colonies (strain 82) on Sabouraud's dextrose agar were moderately growing attaining a diameter of 40 to 50 mm. after 10 days at 25°C. They were cottony (strain 211) or cottony to powdery (strain 82), white, dry, raised and folded a bit. The folds were clear on the reverse side. Reverse of the colony was colourless to yellowish (strain 82) or wine coloured (strain 211, Fig. 2).

Vegetative hyphae were hyaline, septate, branched and 1 6–5.6 ú wide. Two types of conidia (aleuriospores) were borne on the sides and/or tips of these hyphae. The smaller of these or the microconidia were hyaline, pyriform to clavate, mostly aseptate, thin walled, smooth, borne *'en thyrse* only and measured 1.6–2.4 x 4.0–7.2. The larger of the conidia or the macroconidia were numerous (fig. 3), hyaline, smooth, thin-walled, 1 to 6 septate, cylindrical to cylindro-fusiform and measured 4.8–9 6 x 19.2–57.6u. The macroconidia of all the strains studied had a varied tendency to degenerate rapidly forming intercalary chlamydospores. In one of the strain studied these chlamydospores were produced so rapidly that in about 3 weeks old culture hardly any intact macroconidium could be observed. The fungus was keratinolytic and attacked the hair forming perforating bodies.

T. simii in the shape and size of its macroconidia could be confused with that of *M. gypseum* However, the former species could easily be identified from the latter species in having its macroconidia smooth walled. *M. gypseum* produces rough walled macroconidia. *T. simii* resembles closely with *T. mentagrophytes* as both the species have a similar gross morphology. However, microscopically both of these species could be identified, with *T simii* producing clavate to pyriform microconidia which are borne *'en thyrse* only. Microconidia in *T. mentagrophytes* are mostly globose and produced both *'en thyrse* as well as *'en grappe.* The macroconidia in *T. mentagrophytes* are mostly club or cigar shaped and remain for most period intact without forming intercalary chlamydospores whereas the macroconidia of *T simii* are mostly cylindrical to cylindro-fusiform which soon degenerate forming intercalary chlamydospores.

DISCUSSION AND CONCLUSIONS

The results of the present study are in line with those of the [8,10,11,12,13,14,15], results of the surveys by other workers in India in that *T. rubrum* was found to be the most predominant species of the dermatophytes responsible for a majority of dermatophytosis. It has also been found that infections due to *T. simii* are not uncommon. The fungus invades both the skin and the hair and causes superficial lesions.

The geographical distribution of *T. simii* is interersting since so far it has been reported to occur in India only. However, *T. simii* was isolated from a lady in Chicago[16]. This lady has previously stayed at Delhi and most probably she contacted the tinea infection during her stay in India. Similarly, the reported isolation of this fungus from a captive champanze in Japan[17] which was imported from a South African zoo needs confirmation if the fungus responsible for infection had indigenous origin.

Epidimiologically the ringworm fungi falls into three distinct groups namely the zoophilic, the anthropophilic and the geophilic species[18]. The isolation of *T. simii* by different workers from a variety of animals, from the fur of the otherwise apparently healthy small mammals[7] and from feathers of various birds[9] show that the fungus is perhaps zoophilic in nature. However, the isolation of this fungus from man so commonly, as during this study, also suggests that the fungus has not only a preference for animals but also for man. Epidemiologically thus this fungus is similar to *T. mentagrophytes* which has also been kept by Ajello[18] both under zoophilic as well as anthropophilic dermatophytes. The recovery of this fungus from Poona[9] and Delhi[7] soil also suggests that this fungus could survive in the soil. It could, therefore, be concluded that *T. simii* infections in man could not only be transmitted from man to man but also through the agencies like soil, animals and birds.

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