

## A CLINICO-MYCOLOGICAL STUDY ON TINEA PEDIS AT RANCHI

Arun Kumar Singh, Sudhir Kumar Srivastava

Clinical diagnosis of tinea pedis was made in 51 (0.45%) of 11,386 consecutive patients, attending the skin OPD of Rajendra Medical College and Hospital, Ranchi. Direct microscopy revealed fungus in 66.6% of cases, while, 37 (72.5%) were positive by culture, which included 8 (15.5%) KOH negative cases also. This disparity as well as the factors responsible for low prevalence of tinea pedis have been discussed.

*Trichophyton rubrum* was recovered predominantly from the dry, scaly lesions, and also constituted the bulk (48.6%) of isolates as a whole. *Trichophyton mentagrophytes* lay next to it, and was isolated mostly from the vesicular or macerated lesions. *Candida* sp. and *Epidermophyton floccosum* happened to be the other causatives identified.

**Key Words :** Tinea pedis, Dermatophytosis, Causative agents

### Introduction

Tinea pedis has been documented to be the commonest dermatophytosis in western countries. It does not comply, however, with Indian reports.<sup>1-4</sup> These are available from different parts of India, but excepting one from Chhotanagpur,<sup>1</sup> there are none from and around Ranchi (Bihar) till date. The present study has been undertaken to fill this very gap in our knowledge of tinea pedis at Ranchi.

### Materials and Methods

Unselected 51 cases of tinea pedis were studied clinically, and investigated by direct microscopy and culture.

Following the usual standard procedure of collection, the material was examined in 20% fresh KOH by direct microscopy. Part of each specimen, collected in a black packet was planted on media slants of modified Sabouraud's dextrose agar supplemented with chloramphenicol (0.04 mg/ml) and cycloheximide (0.5% mg/ml). The inoculated

tubes were incubated at room temperature and examined thrice weekly upto 4 weeks before discarding as negative.

The fungi isolated were identified on the basis of the colony grown and microscopic characters in lactophenol cotton blue stained smears.<sup>5</sup>

### Results

Intertriginous scaling (with slight extension to the adjacent plantar and/or dorsal surface) type was the commonest presentation observed in this series. Male outnumbered females by a ratio of 4:1 in 51 (0.45% of total 11,386 skin patients and 6.78% of 752 tinea cases in toto) cases of tinea pedis studied.

More or less all age groups were affected, but the group of 21-30 years recorded maximum number of cases (Table I). Foot wearing habit was discovered in most of the cases.

Culture positivity was recorded in 37 (72.55%) out of 51 specimens studied. It included 29 (56.86%) KOH positive and 8 (15.69%) KOH negative cases. Despite KOH positivity in 5 (9.8%) samples, culture failed to yield any growth in them. Thirty four (66.66%)

From the Department of Skin and VD,  
Rajendra Medical College, Ranchi - 834 009,  
India.

Address correspondence to : Dr Sudhir Kumar  
Srivastava.

**Table I.** Age and sex incidence

Sex	Male		Female		Total	
	No.	%	No.	%	No.	%
Age in years						
00-10	2	3.92	1	1.96	3	5.88
11-20	8	15.69	2	3.92	10	19.61
21-30	19	37.26	4	7.84	23	45.10
31-40	5	9.80	0	0.00	5	9.80
41-50	4	7.84	0	0.00	4	7.84
51 & above	3	5.88	3	5.88	6	11.76
Total	41	80.39	10	19.61	51	100%

**Table II.** Comparative study of direct microscopy and culture

	KOH	+Ve	KOH	-Ve	Total	
	No.	%	No.	%	No.	%
Culture +Ve	29	56.86	8	15.69	37	72.55
Culture -Ve	5	9.80	9	17.65	14	27.45
Total	34	66.66	17	33.34	51	100%

**Table III.** Species isolated and their incidences

	Intertriginous scaling & dry squamous type		Wet vesicular & macerated type		Total	
	No.	%	No.	%	No.	%
<i>T. rubrum</i>	17	45.95	1	2.70	18	48.65
<i>T. mentagrophytes</i>	4	10.81	7	18.92	11	29.73
<i>E. floccosum</i>	2	5.40	1	2.70	3	8.11
<i>Candida sp.</i>	0	0.00	3	8.11	3	8.11
Unidentified	2	5.40	0	0.00	2	5.40
Total	25	67.57	12	32.43	37	100%

in all were positive by direct examination of KOH wet mount (Table II).

Sharing 18 (48.65%) of 37 isolates, *Trichophyton rubrum* happened to be the chief isolate among all. 94.4% (17 isolates) of it belonged to either dry squamous or interdigital scaling type. Seven (63.6%) out of

11 isolates of *Trichophyton mentagrophytes* were recovered from wet vesicular or macerated type, on the other hand *Candida sp.* and *Epidermophyton floccosum* ranked third by sharing 3 (8.11%) cases each. Identity of the rest 2 colonies could not be established in this series (Table III).

Amongst various associated diseases, hyperhidrosis (9 cases) and atopic dermatitis (5 cases) appeared to be consistent to some extent, while others displayed nothing more than casual coincidences.

## Comments

Compared to several reports<sup>3,4,6</sup> the lower incidence of tinea pedis in the present series need to be explained by taking certain facts into consideration. Large section of the native tribals and others do not wear shoes regularly. Secondly, Ranchi, at an altitude of about 2000 feet above the sea level is relatively temperate in comparison to high humid coastal areas like Bombay, Calcutta, Kerala etc. which are suitable for the growth of fungus. Again, many of the actual sufferers do not attend the hospital due to lack of health awareness, illiteracy, poverty and also due to the absence of troublesome and embarrassing symptoms in most of the cases. And lastly the hospital percentage of such cases is diluted by the high incidence of leprosy and scabies, prevalent in this area.

Indoor dwelling and lack of shoe wearing in female section, explains to some extent, the male predominance in incidence observed here. The age group of 21-30 years covering maximum number of patients agrees with many reports.<sup>2,7</sup> It may be attributed to more participation in active field work, high incidence of hyperhidrosis, and shoe wearing encountered in this age group.

Supported by various reports, 15.69% (8 cases) of KOH negative cases yielding growth in culture in our study suggest that both direct as well as culture examination should be undertaken simultaneously in any doubtful case of dermatophytosis. To explain the differences in the results of culture and KOH examination, the presence or absence of infecting agent in

the particular specimen examined, may be taken into account. The culture results also depend upon, whether the nutritional and other requirements like optimum temperature for growth etc. are adequately met or not. The role of contaminants also, can not be ruled out in this context.

Some workers<sup>6,8,9</sup> have revealed *Trichophyton mentagrophytes* as the chief isolate from tinea pedis cases, but most others<sup>2-4,10</sup> reports are in keeping with the trend observed in the present series led by *Trichophyton rubrum* in 48.65% cases as a whole. Some<sup>3,11</sup> have correlated the dry squamous or hyperkeratotic lesions of T. pedis with *Trichophyton rubrum* on one hand, and wet vesicular or macerated lesions with *Trichophyton mentagrophytes* on the other. We have recorded the isolates almost in complete agreement with it (Table III). In sharp contrast to it an unusual case of bullous tinea pedis in a 2-year-old girl has been reported by Maroon and Miller (1989) caused by *T. rubrum*. We, also have come across a case of 2-year-old girl presenting with sodden macerated lesions in 2nd and 3rd toe web spaces of the right foot, but could not isolate the fungus in culture seen in direct microscopy. The second unusual presentation of this series was the typical ringworm (not seen in T. pedis usually) fashion of Tinea pedis lesion in a young adult caused by *Epidermophyton floccosum*.

## References

1. Prasad VB, Prakash APS. Dermatophytic profile of Chhottanagpur. Ind J Dermatol Venereol Leprol 1979; 45: 103-10.
2. Banerjee U, Sharma AK. A study of dermatophytosis in Delhi. Ind J Dermatol Venereol Leprol 1984; 50: 41-4.
3. Ramanan C, Singh G, Kaur P. A clinico-mycological study of tinea pedis in north eastern India. Ind J Dermatol Venereol Leprol

Ind J Der  
1985:  
4. Moha  
India-  
351-6  
5. Elev  
myco-  
Derm  
6. Allen  
Auct  
eryt  
391-  
7. Mah  
Stu  
(Ke  
11-7

Ven  
Pre-  
Top  
Cor  
Ear  
Las  
Sp  
Fo  
Fo  
Or

L  
F  
S

Ind J Dermatol Venereol Leprol 1994; 60

1985; 51 : 40-1.

4. Mohapatra LN: Study of medical mycology in India- an overview. Ind J Med Res 1989; 89 : 351-61.

5. Elewski BE, Hazen PG. The superficial mycoses and the dermatophytes. J Am Acad Dermatol 1989; 21 : 655-73.

6. Allen S, Christmas TI, McKinney W, et al. The Auckland skin clinic tinea pedis and erythrasma study. NZ Med J 1990; 103 : 391-3.

7. Maheshwari A, Paniker CK, Gopinathan T. Studies on dermatomycoses in Calicut (Kerala). Ind J Pathol Microbiol 1982; 25 : 11-7.

8. Sharma NL, Gupta ML, Sharma RC, et al. Superficial mycoses in Simla. Ind J Dermatol Venereol Leprol 1983; 49 : 266-9.

9. Attye A, Auger P, Joly J. Incidence of occult athlete's foot in swimmers. Eur J Epidemiol 1990; 6 : 244-7.

10. Champion RH, Burton JL, Ebling FJG. Tinea pedis. In : Textbook of Dermatology, 5th edn. London : Blackwell Scientific, 1992; 1154-6.

11. Maroon MS, Miller OF. *Trichophyton rubrum* bullous Tinea pedis in a child. Arch Dermatol 1989; 125 : 1716.

12. Terrence CO, Eleanor ES. Investigation of asymptomatic tinea pedis in children. J Am Acad Dermatol 1991; 24 : 660-1.

## Announcement

### XXIII National Conference of IADVL

Venue	: Savera Hotel, Madras.
Pre-conference CME	: 26-1-1995.
Topic	: Sexually Transmitted Diseases and AIDS
Conference	: 27, 28 & 29-1-1995.
Earliest last date for Regn	: 31-8-1994. Regn Fee Rs. 750.
Last date with Late fee	: 31-10-1994. Regn Fee Rs. 850.
Spot Regn. Fee	Rs. 950.
For Pre-Conference CME	Rs. 100.
For Registration Contact	
Organising Secretary	: Dr M Jayaraman 222, R K Mutt Road, Mylapore, Madras - 600 004 Phone : 4942353
Last date for Abstracts	: 30-9-1994.
For Details Contact	: Dr Jayakar Thomas
Scientific Committee Chairman	: 26, West Mada Church Road, Royapuram, Madras - 600 013 Phone : 5228484