

A STUDY ON THE ECOLOGY AND TREATMENT OF DERMATOPHYTOSIS IN DELHI

By

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Medical Mycology antedates the bacteriology by decades¹ but the research was confined towards bacteriology till 19th century as bacteria cause more human sufferings than fungi. But lately in 20th century, the trend of the research workers has diverted towards mycology and work has not only been towards pathogenic fungi and the airborne fungi because of their potentiality to produce allergy but towards useful fungi also which produce life saving drugs like antibiotics.

In India it was Powell² who in 1909 for the first time reported the prevalence of tinea infections in Assam and ever since then reports from several eminent workers in the country i. e. Desai and Bhat³, Kandhari and Sethi⁴, Kalra *et al*⁵, and others^{6, 7, 8, 9, 10} on the ecological aspects of dermatophytoses in India have appeared in the literature.

The present study was undertaken in the year 1967 to evaluate therapeutic efficacy of some of the antifungal preparations available alongwith the ecology of superficial mycoses amongst these patients.

Material and Methods. The patients attending the OPD Willingdon Hospital who represented all sections of society and suspected of having dermatophytic infections were taken in the project.

The clinical data of age, sex, the details of lesions, past recurrences if any with their duration and treatment taken in the past were recorded on a specially designed proforma. The scrapings were examined with 10 to 20% KOH and cultured on Sabouraud's agar media. Other routine mycological techniques were subsequently used for typing of the species.

The patients were given various local or oral treatments. The choice of a particular case for one type of treatment was made by the number of lesions, the local reaction, and the intensity of subjective symptoms. The cases with fewer lesions were treated with local therapy while those with multiple and extensive lesions were given oral treatment.

1. Dermamycin* applied topically twice a day.
2. Bradex vioform** applied topically twice a day.
3. Griseofulvin tablets one gramme daily orally after meals.

* Dermamycin is an antifungal preparation manufactured by Hindustan Antibiotics Ltd. This contains Hamycin-Dermostatin which are antifungal antibiotics and are produced from *Treptomyces pimprina* and *S. viridogriseus* respectively.

** Bradex vioform is an antifungal preparation manufactured by CIBA private Ltd.

The period of treatment for the local application ranged from 1-8 weeks unless the lesions showed aggravation or inflammation, which necessitated a change to oral treatment. The patients who started treatment with oral griseofulvin tablets were given treatment for 6 weeks. Many patients discontinued their treatment on their own before completion of the full course as fixed above and their improvement is reported here upto the time they actually took the treatment.

Subsequently scrapings were taken after giving the treatment every fortnightly and the clinical improvement like activity of lesions, and their extent were recorded and graded as fair (+), good (++), very good (+++) and excellent (++++). As soon as the course of treatment was completed, scrapings were taken again from the original involved sites for KOH and culture examination. Thereafter they were followed at monthly intervals for 3 months and then the following year from April onwards during summer and rainy season, when the incidence is usually high or earlier in case of recurrence of symptoms or lesions or the appearance of the new lesions.

The data collected :

1. Total number of cases taken for study in 1967.	294
2. Total number of cases taken for study in 1968.	442
	736
3. The number of positive cultures	554
4. Number of cases with positive KOH but the cultures were either negative or contaminated and could not be typed.	182

OBSERVATION AND DISCUSSION

TABLE 1

A comparison of the results of different tinea manifestations obtained by various workers in India.

S. No.	Authors	tinea corporis	tinea cruris	tinea pedis	tinea barbae	tinea capitis	tinea unguium	tinea manus
1.	Gupta and Shome. Lucknow.	39.6	35.6	15.6	3.9	3.2	1.9	—
2.	Desai and Bhat Bombay	80.5		2.5	0.69	9.9	5.1	1.1
3.	Kalra <i>et al.</i> Delhi	54.6	26.6	13.0	—	3.0	2.2	—
4.	Kandari and Sethi Delhi.	57.5	21.2	13.9	—	2.1	5.1	—
5.	Mehta-Delhi	45.5	43.8	6.3	—	—	0.7	3.6
6.	Vasu-Warangal	60.0	23.6	9.3	2.9	0.4	3.4	—
7.	Present series. Delhi.	58.1	38.2	1.4	—	0.18	1.2	0.7

Table 1 shows the sites involved by superficial mycoses and it will be observed that the max number of cases were of tinea corporis which formed 58.92% and this was followed by tinea cruris which formed 38.87% of the cases,

Thus our series is commensurate with the reports of Desai and Bhat³, Kandhari and Sethi⁴, Kalra et al⁵, and Vasu¹⁰ who have also reported tinea corporis followed by tinea cruris as the commonest sites to be involved. However, there is slight variation in the results of the involvement of these two sites as compared with Gupta and Shome 1959⁷ (Lucknow), Mehta 1965⁹ (Delhi) but even in these two reports the predominance of tinea corporis and tinea cruris still remains. Thus, there was no difference of the involvement of the various sites in different geographical areas as reported by various workers all over the country. The incidence of involvement of tinea pedis, tinea capitis, tinea unguinum and tinea manus was, however, small at all the places.

TABLE 2

A comparison of the incidence of different dermatophytes isolated by various workers in India.

S. No.	Authors	T. rubrum	T. mentagrophytes	T. violaceum	T. simii	T. tonsurans	T. verrucosum	M. audouini	E. floccosum	M. gypseum	M. canis	T. schoenlein
1.	Gupta and Shome (Lucknow)	56.7	31.7	—	—	—	9.6	—	1.9	—	—	—
2.	Desai and Bhat. Bombay	84.4	2.3	8.8	—	1.8	—	—	2.3	0.23	—	—
3.	Kalra et al. Delhi	89.6	9.6	3.5	—	0.4	—	—	3.0	—	—	—
4.	Kandhari and Sethi. Delhi.	68.5	9.5	1.0	—	15.0	—	10	1.5	2.5	0.5	0.5
5.	Mehta-Delhi.	75.2	15.4	6.0	—	0.7	—	—	2.7	—	—	—
6.	Vasu-Warangal	62.6	16.8	4.8	—	3.6	—	—	12.0	—	—	—
7.	Klokke and Durai Raj Vellore	33.9	12.5	32.4	0.8	10.1	—	—	9.3	—	—	—
8.	Present series Delhi.	92.0	2.3	0.06	2.7	1.6	—	—	1.8	—	—	—

Table 2 shows the dermatophytes isolated from cases of superficial mycoses in our series as compared with the work of other authors in the country.

It will be observed that the predominant species incriminated for the causation of dermatophytoses was *Trichophyton rubrum* as reported from different parts of the country although the figures have varied from 33.9% at Vellore⁸ to 84.4% at Bombay³ with our series having 92.0%. Similar variations were observed in the incidence of other species. The incidence of *T. mentagrophytes* was 2.1% to 31.7%, and our figure tallies with the result of other workers except Gupta and Shome⁷ who have reported isolation of this dermatophyte as high as 31.7%. Next in order of frequency were *T. tonsurans* (0.4% to 15.0%) *T. violaceum* (0.06% to 32.4%) and *E. floccosum* (1.5% to 12.01%) and here too with minor variations, our series agree with the results of other workers. The incidence of *E. floccosum* appears to be higher in South India^{8, 10} as compared to the plains of North India. *T. schoenlein*, *M. audouini*, and *M. canis* have been observed to cause dermatophytosis rarely and we have not been able to isolate them during our study. In

the plains of Northern India, it could be observed that the frequency of various species involved in descending order was *T. rubrum*, *T. mentagrophytes*, *T. tonsurans*, *E. floccosam* and *T. violaceum* with some variation in individual percentage. However, at Bombay³ *T. violaceum* was next to *T. rubrum* in the frequency of involvement.

T. simii as seen from various published reports has yet only been reported from Vellore⁸ where it had an incidence of 0.8% whereas in our series it had an incidence of 2.1%.

A solitary instance or involvement by two dermatophytes was observed in one of the patients on two different lesions. The different species isolated were *T. rubrum* from the groins and *T. tonsurans* from the leg lesion.

TABLE 3

Incidence of dermatophyte infections in relation to the age and sex.

Sex	upto 9	Age group in years					Total	Percentage
		10-19	20-29	30-39	40-49	50 & above		
Male	12	126	158	100	88	74	558	75.81
Female	3	17	30	50	40	38	178	24.17
Total	15	143	188	150	128	112	736	

It will be seen from the table 3 above that although no age and sex was exempt from involvement by dermatophytoses the incidence was commoner in 10-49 years age group and was commonest in 20-29 years age group and indicates prevalence in the adolescent and adulthood. The males outnumbered the females in our series.

TABLE 4.

Therapeutic response to various anti-fungal preparations.

Medicine	Total cases	Cases followed	Aggra- vation	No. improvement	IMPROVEMENT			
					+	++	+++	++++
Griseofulvin	423	346	—	2.6*	2.0	8.0	9.8	77.4
Dermamycin	284	184	10.8	33.1	15.2	17.3	5.4	17.9
Bradex-vioform	81	62	4.8	22.5	6.4	17.7	8.0	40.3

* figures show percentage of cases in each category.

The total number of cases treated with various treatments shown in the table 4 is larger than the actual number of cases i. e. 736 taken on the study as a few cases who had not improved with the initial treatment were changed to another treatment and thus assessed for both.

It could be observed from table 4 that oral griseofulvin remains the drug of choice for the treatment of dermatophytosis. An excellent (++++) improvement was observed in 77.4% cases who took griseofulvin as compared to 17.9% and 40.3% cases only who took Dermamycin or Bradex-vioform respectively.

Similarly, the cases who did not show any improvement with any of the treatment was far less with griseofulvin (2.6%) than with dermamyacin (33.1%) and bradex-vioform (22.5%). Aggravation of lesions during the course of treatment was observed with the use of dermamyacin and bradex-vioform only in 10.8% and 4.8% cases respectively. We did not come across any case developing an allergic reaction with the use of these three drugs. However, one case under griseofulvin therapy showed a mild photo-toxic reaction which was relieved on discontinuation of the treatment. As regards dermamyacin, the manufacturers of this preparation supplied it in 1967 in the form of an ointment and in 1968 in a solution form in N-Butanol. The dermamyacin ointment was better tolerated by patients than dermamyacin solution which not only had a very strong odour but also that an application of it caused much irritation. There was, however, not much difference between these two dermamyacin forms as regards their therapeutic efficacies.

TABLE 5

Showing cases in percentage having improved (++++) during various duration of treatment taken.

Medicine	upto 2	Treatment in weeks			Total cases with improvement (++++)
		2-4	5-6	more than 6	
Griseofulvin	13.8	19.0	43.2	23.8	268
Dermamyacin	12.1	21.2	18.1	48.4	33
Bradex-vioform	32.0	8.0	28.0	32.0	25

Table 5 shows that with griseofulvin therapy an excellent (++++) relief was obtained in most of the cases (43.2%) in some what shorter duration i.e. 5-6 weeks. Dermamyacin as compared to griseofulvin took in most of the cases (48.4%) more than 6 weeks time to attain the same relief.

TABLE 6

Showing positive cultures in clinically cured cases after various modes of treatment and the species of fungi isolated.

Treatment given	Total cases	No. of cases positive after treatment	Percen- tage.	Species isolated	
				<i>T.</i> <i>rubrum</i>	<i>T.</i> <i>tonsurans</i>
Griseofulvin	521	6	1.42	6	—
Dermamyacin	287	5	1.76	4	1
Bradex-vioform	81	—	—	—	—

Table 6 shows that *T. rubrum* was isolated in culture from 6 patients who apparently had no lesions after taking a full course of griseofulvin treatment for 6 weeks. Similarly, 5 cultures of *T. rubrum* and one of *T. tonsurans* were raised

from 6 patients who apparently had been relieved of their lesions after a 6-8 weeks course of dermamyacin treatment. It may therefore be suggested that the various treatments should not be discontinued soon after the disappearance of lesions but may be continued till repeated microscopic and cultural examinations are negative.

SUMMARY

We have presented 736 cases of superficial mycoses with the mycological study as well as the comparative therapeutic effect of oral griseofulvin and local treatment with dermamyacin and bradex vioform. The incidence of various dermatophytes isolated in descending order was *T. rubrum*, *T. mentagrophytes*, *T. simii*, *E. floccosum*, *T. tonsurans* and *T. violaceum*. A solitary instance of involvement by two dermatophytes was observed in one of the patients on two different lesions.

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