

DETECTION OF ANTIBODIES AGAINST DERMATOPHYTIC ANTIGENS IN PITYRIASIS VERSICOLOR INFECTIONS

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Abstract

One hundred and fourteen clinically suspected cases of pityriasis versicolor infection were screened for fungal elements in skin scrapings by direct Microscopy and detection of antibodies against some of the dermatophytes. About 95% of the patients belonged to the age group of 11-30 years. Fungal elements suggestive of *P. furfur* were demonstrated in 90.6% of patients. Humoral antibodies against antigens of dermatophytes were demonstrable in 17 (15%) patients as against in only 1 out of 60 (1.7%) apparently healthy subjects.

Pityriasis versicolor is an easily diagnosed, common, relatively trivial, probably non-contagious and a symptomatic but extremely chronic superficial infection of the skin. It is prevalent worldwide but is seen more commonly in hot and humid climates. The etiological agent *Pityrosporum furfur* remains localised in the stratum corneum. Untreated lesions may persist, spread and reappear for many years and the disease is not self-limited¹. The disease occurs in normal healthy people but has a higher incidence in immunosuppressed individuals². Information on immunology of this disease is completely lacking¹. While studying immunological aspect of dermatophytosis, we detected precipitins against dermatophytic antigens in a

few cases of pityriasis versicolor. The work was thus further extended to find out the incidence of these humoral antibodies in such cases.

Materials and Methods

One hundred and fourteen clinically suspected cases of pityriasis versicolor infection attending the Dermatology Department of Postgraduate Institute of Medical Education and Research, Chandigarh, during a period of one year, were subjected to the study. Those patients with a history of dermatophytosis or any other skin disease during the previous one year and others with systemic diseases were excluded from the study.

Skin scrapings were collected by the usual technique after cleaning the area with 70% alcohol. A part of it was examined in 10% KOH and part was cultured on Sabouraud's dextrose agar with chloramphenicol (0.05 mg/ml) and cycloheximide (0.05 mg/ml) at 30°C for isolation of dermatophytes. No effort was made to culture *Pityrosporum furfur*.

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TABLE 1

Showing positivity of sera in pityriasis versicolor against various dermatophytic antigens*

Total No. of sera tested	Positive	TR (1)	TM (2)	TT (4)	MV (5)	TV (7,11,12,13,14)	EF (8,15)	MG (15)
114	17 (15.0%)	8 (7%)	6 (5.2%)	4 (3.5%)	4 (3.5%)	4(2+2+2+1+0+0) (3.5%)	7 (6.1%)	4 (3.5%)
Control† 60	1	1	0	0	0	0	0	0

*TR - *Trichophyton rubrum*, TM - *T. mentagrophytes*, TT - *T. tonsurans*, MV - *Microsporum vanbreuseghemii*, TV - *T. violaceum*, EF - *Epidermophyton floccosum*, MG - *M. gypseum*.

† Control - Subjects with no skin disease during the previous 2 years.

About 5 ml of blood was collected from all patients. Sera were separated and stored at -20°C after adding thio-merosal solution to get a final concentration of 1:10,000. Similarly, 60 sera were collected from carefully selected healthy individuals with no history of any skin disease during the past 2 years as controls.

Strains used for preparation of antigens were *Trichophyton rubrum* (Table 1) (Code No. 1), *Trichophyton mentagrophytes* (Code No. 2), *T. violaceum* (Code Nos. 7, 11, 12, 13 and 14), *T. tonsurans* (Code No. 4), *Microsporum vanbreuseghemii* (Code No. 5) *M. gypseum* (Code No. 10), *Epidermophyton floccosum* (Code No. 8 and 15). The procedure adopted for the preparation of antigens was that of Bloch³, and Peck & Glick⁴ with slight modifications by Talwar et al⁵. Briefly final concentration of 1 gm wet weight of the mycelial mat per 3 ml. of sterile physiological saline was used. The mycelial mat was first ground and then ultrasonicated. All antigens were seitz-filtered, checked for sterility, preserved with 0.5% phenol and stored at -20°C .

Precipitins were detected by immunogel diffusion technique of Ouchterlony⁶.

Results

Out of a total of 114 patients tested, 80% of the patients had lesions on the neck and front of the chest. Majority of the patients (95%) were in the age group of 11-30 years. There were only six patients above the age of 30 years. 84 patients were males and 30 females, indicating male preponderance, with 3:1 ratio.

Fungal elements suggestive of *Pityrosporum furfur* were seen in the skin scrapings of 96 out of 106 (90.6%) patients examined by direct microscopy. Smear examination could not be attempted in 8 patients due to local application of some medicine during the previous 24 hours. Cultures on Sabouraud's dextrose agar were sterile, except for growth of *Trichophyton rubrum* in one instance where skin scrapings showed *P. furfur* only.

Humoral antibodies against dermatophytic antigens could be demonstrated in 17 (15%) patients only by agar gel diffusin method.

As shown in Table I the precipitin bands were observed against the antigens of *T. rubrum* in 8 patients (7%) followed by *E. floccosum* in 7 (6.1%),

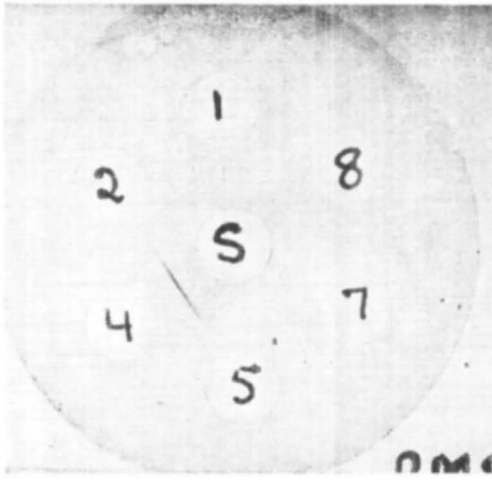


Fig. 1 Gel diffusion plate showing positive precipitin band with antigen 4 i.e. *Trichophyton tonsurans*.

T. mentagrophytes in 6 (5.2%) and *T. violaceum*, *T. tonsurans* (Fig. 1), *M. vanbreuseghemii* and *M. gypseum* detected in 4 (3.5%) patients each. Serum from the patient who had a mixed infection with *T. rubrum* was, however, negative for such precipitins.

Discussion

The study indicates that pityriasis versicolor primarily occurs at puberty and in young adults. About 95% of the patients were in age group of 11-30 years. There were only 6 out of 114 (5%) patients who were above 30 years of age and none above 45 years. These findings are in concurrence with findings in previous reports^{1,7,8} and suggest correlation with sebum secretion rate⁹.

Earlier reports suggest that both sexes are equally affected but the present study indicates an apparent male preponderance. Since lesions tend to become more apparent after exposure to sunlight¹⁰, it is possible that males who work outdoors more often than females tend to notice their lesions oftener than females and thus report to the clinic more frequently. Neck and chest were the commonest

sites of involvement as has been reported previously¹¹.

The 15% positivity rate of precipitins in pityriasis versicolor to various dermatophytic antigens is similar to the positivity of these antibodies in dermatophyte infections (15.6%) and other non-tinea skin infections (15.4) as also shown earlier⁵. Carefully selected 60 controls with no skin disease during the previous two years indicated a very low rate of positivity (1.7%) of these antibodies (Table 1). Serum of the patient who had mixed infection with *Pityrosporum* and *T. rubrum* was also negative for precipitins. It was evident from our previous study⁵ that the demonstration of precipitins

may not be of value in the serodiagnosis of dermatophytic infections. It seems from the present study, that it will not be helpful in pityriasis versicolor infections also with the currently used dermatophytic antigens, as negative results do not exclude the possibility of either of the above infections.

Dermatophytosis and pityriasis versicolor are both superficial skin infections. Whether there exists any serological relationship between dermatophytes and *P. furfur* is not known so far. The findings of the present study are also not helpful in this regard because investigations with specific antigen of *P. furfur* could not be carried out due to the non-availability of this fungus in pure culture.

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Congratulations :

Dr. Rishi Kumar Bhargava, Honorary Secretary of Rajasthan state branch (IADVL) who is working as Reader in Skin and STD at SMS Medical College, Jaipur has been awarded Commonwealth Medical Fellowship 1981. He is to work on "Genital Herpes and Collagen disease" during his stay in U.K. He left the country on 29th March 1981.

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