Antibodies to *Pityrosporum orbiculare* in Patients with Tinea Versicolor and Controls of Various Ages

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Sera from patients with tinea versicolor and controls of various ages were investigated with the indirect immunofluorescence technique for antibodies against *Pityrosporum orbiculare*, the etiologic agent of tinea versicolor. No differences in titers were observed between patients and adult controls. Also, there were no differences in antibody titers in the patient group with regard to age and sex, or to duration and distribution of lesions. A statistically significant difference in antibody titers was observed between adult controls and children, particularly the youngest.

Antibodies against *Candida albicans* from randomly selected sera from the same groups showed the same tendency, although only statistically significant when children of 5 years or younger were compared with adult controls.

This investigation indicates that although *P. orbiculare* is capable of inducing antibodies, these are not correlated to tinea versicolor but occur when an individual becomes colonized with the organism.

*Pityrosporum orbiculare* is a member of the normal human cutaneous flora [1-3], and also the etiologic agent of tinea versicolor [4,5]. *P. ovale*, another member of the genus *Pityrosporum*, is probably identical to *P. orbiculare* [4-7]. *P. orbiculare* can be cultured from the normal skin in the majority of adults [1-3,8], but usually not from newborns or infants [8].

In 1961, Sternberg and Keddie described antibodies against *P. orbiculare* in 2 patients with rapidly spreading tinea versicolor [5]. In 1967, using the indirect immunofluorescence (IF) technique, Alexander found antibodies against both *P. orbiculare* and *P. ovale* in patients with dandruff [10]. In a recent report comparing patients with tinea versicolor and patients with chronic mucocutaneous candidiasis, antibodies against *P. orbiculare* were found in both patients with tinea versicolor and controls [11]. Antibody titers were higher in patients compared to controls [11]. Sohnle and Collins-Lech had earlier reported that cell-mediated immunity against *P. orbiculare* is defective in patients with tinea versicolor [12].

The aim of the present study was to compare antibody titers against *P. orbiculare* in patients with tinea versicolor and controls of various ages.

**MATERIALS AND METHODS**

**Characteristics of Patients**

We investigated antibodies against *P. orbiculare* in 30 patients with tinea versicolor. The diagnosis was confirmed clinically with Wood's light, and microscopically. They were also studied with regard to age and sex distribution and with regard to duration and distribution of tinea versicolor lesions.

**Characteristics of Controls**

Fifteen patients with a mild eczema of the hands and 6 healthy volunteers were included, all of these had never had tinea versicolor. Six umbilical cord sera and, as a control, sera from their mothers were investigated. To look for differences in antibody titers among ages, six-month-old (n = 8), 5-year-old (n = 8), 10-year-old, (n = 10), and 15-year-old (n = 10) children were studied. Among the children six months of age, 2 had a cerebral tumor, 1 congenital heart disease, 1 epilepsy, 1 was a healthy control, and 3 had acute infectious diseases. The other control children consisted of 11 with epilepsy and 17 with food allergies; these 28 patients were all ambulatory.

**IF/Technique on Sera from Patients with Tinea Versicolor and Controls**

Cells of *P. orbiculare*, ATCC No. 42132, were used as the antigen. For controls, all sera from patients and adult controls and 6 sera from each group of children at the age of 5, 10, and 15 years were also incubated with cells of *Saccharomyces cerevisiae* from our own collection. Six sera from each of the groups of adults and children, and the 6 umbilical cord sera were also incubated with cells of *Candida albicans*, 207A, originally obtained from Dr. H. F. Hasenclever (National Institutes of Health, Bethesda). In addition, sera from 6 patients with tinea versicolor and 6 adult controls were also studied for antibodies against *P. ovale*, ATCC No. 1452. *P. orbiculare* and *P. ovale* were grown at 37°C for 3 days on a medium containing olive oil, glycerol monostearate, and Tween 80. The medium has been described in detail [6]. *C. albicans* and *S. cerevisiae* were grown at 37°C on Sabouraud's agar.

**RESULTS**

The 30 patients with tinea versicolor included 20 females and 10 males with a mean age of 34 years. Duration of tinea versicolor varied between 6 months and 11 years, mean 2.5 years. Most of the patients had nummular lesions on the upper trunk, but 7 had extensive lesions, with more than half of the trunk skin involved. The adult controls were 15 females and 7 males, mean age 39 years. The mean antibody titers, against *P. orbiculare*...
of sera from patients with tinea versicolor and adult controls, particularly in the youngest. In the younger groups of children only low antibody titers (<40) were seen, and this can be compared to our earlier culture study [8]. The reason why no statistically significant difference in antibody titers against P. orbiculare was observed between sera from patients with tinea versicolor and adult controls and why only low titers were seen in small children may be that the production of antibodies is dependent only on colonization with the organism. P. orbiculare is lipophilic and the sebaceous glands mature and grow during prepuberty and puberty. This may be one explanation why P. orbiculare is seldom cultured from the skin of infants and, therefore, also an explanation to the low antibody titers in small children.

The antibody titers against P. orbiculare in the umbilical cord sera were lower than the titers in the sera of their mothers but significantly higher than serum titers from 6-month-old children. These differences are most likely explained by the transport of antibodies from the mother to the fetus across the placenta barrier.

We found the same antibody titers against P. ovale and P. orbiculare; in agreement with our earlier studies [5,6], this once again confirms the identity of these two organisms.

In one 10-year-old boy an antibody titer of 40 against S. steineri was found, all other sera were negative. S. steineri is cultured from plants [14] and not from humans, and we included it as a control in our system.

Antibody titers against C. albicans are often found in sera from healthy individuals, controls, and people with other diseases than candidiasis [11,15]. C. albicans as P. orbiculare is an opportunistic pathogen and is often cultured from the gastrointestinal tract or vagina in adults, more seldom in children [15]. This is in agreement with our results regarding antibody titers, where the lowest titers were found in the youngest children.

In conclusion, this study indicates that antibodies against the yeast phase of P. orbiculare cannot be used in the diagnosis of tinea versicolor because they are not limited to patients with this disease. It would be interesting to look at antibody titers against both the yeast and filamentous phase of P. orbiculare. It has been shown in tinea versicolor that when P. orbiculare becomes invasive it changes from its yeast to its filamentous phase [4,5]. From deep infections with C. albicans it is well known that there may be differences in antibody response against the yeast and filamentous phase of C. albicans [15,16].

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REFERENCES
Announcements

In 1983, the Certifying Examination of the American Board of Dermatology will be held on October 30 and 31 in Chicago, Illinois. The deadline for receipt of applications is May 1, 1983.

The Dermatopathology special competence examination will be held in Chicago on November 1, 1983.

For further information on either of these examinations: Clarence S. Livingood, M.D., Executive Director, American Board of Dermatology, Henry Ford Hospital, Detroit, Michigan 48202.

The Society for Pediatric Dermatology will hold its Annual Educational Meeting at Kiawah Island, South Carolina, July 21-23, 1983. For information: James E. Rasmussen, M.D., Department of Dermatology, University of Michigan Medical Center, 1405 E. Ann Street, Box 031, C-2069, Ann Arbor, Michigan 48109.

The Twenty-Fifth Annual Postgraduate Course in Dermal Pathology will be held July 31 to August 5, 1983 at The Newport Resort, Newport Beach, California. The course is designed primarily for pathologists and dermatologists interested in cutaneous pathology. For further information: Margaret Frederick, Assistant Director, Memorial Hospital Medical Center of Long Beach—University California of Irvine Center for Health Education, 2801 Atlantic Avenue, P.O. Box 1428, Long Beach, California 90801 (213) 595-3823.)