Tinea Versicolor : A Prospective Survey

Jacek C Szepietowski[1], Eugeniusz Baran[1] and Ewa Wild[2]

[1]Department of Dermatology and Venereology, University of Medicine, Wrocław, Poland
[2]Novartis Pharma, Warszawa, Poland

=Abstract=

Background: Tinea versicolor is regarded as one of the most common dermatoses. It constitutes about 3% of dermatological patients.

Objective: The present study was undertaken to evaluate the frequency of tinea versicolor among patients with fungal skin infections. Special attention was paid to sex and age distribution, as well as to the associated cutaneous and systemic disorders.

Material and Methods: The study was based on 2665 questionnaires. The clinical diagnosis of tinea versicolor was confirmed by positive direct mycological examination in 10~20% potassium hydroxide solution with addition of dimethyl sulfoxide and by yellow-orange Wood's lamp fluorescence of the lesions.

Results and Conclusions: Tinea versicolor was diagnosed in 325 patients (12.2% of all patients with different fungal skin and nail infections). Female patients constituted 52.3% and males 47.7%. The majority of patients were from the big towns (81.2%), only 4% of patients lived in the rural areas. 45.3% of patients finished secondary school, 23.4% had higher education. The age of patients varied from 10 to 79 years, mean age 36.1±15.3 years. Tinea versicolor was diagnosed in 45.0% of patients between the age of 16 and 35 years and it was uncommon in children (5.2%). The duration of the disease was 1 week to 23 years, mean 2.5±3.5 years. 49.5% of patients were previously treated with different regimens. Other cutaneous abnormalities were found in 20.6% of patients with tinea versicolor. Among them acne (4.9%), seborrheic dermatitis (3.1%) and onychomycosis (3.1%) were the most common ones. 14.5% of tinea versicolor patients suffered from systemic diseases, such as arterial hypertension (4%), thyroid abnormalities (3.1%), coronary insufficiency (2.5%) and diabetes melllitus (1.5%).

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Key Words: Tinea versicolor, *Malassezia furfur*, Epidemiology

INTRODUCTION

Tinea versicolor, also called pityriasis versicolor, is a superficial cutaneous fungal infection characterized by reddish or brownish slightly scaly macules which tend to coalesce into larger patches. Later the macules and patches become hypopigmented. Usually the lesions are located on the neck, but other sites of the skin, such as upper trunk and upper extremities are also common[1,2].

Address for correspondence: Dr Jacek C Szepietowski, Associate Professor, Department of Dermatology and Venereology, University of Medicine, Ul. Chałubińskiego 1, 50-368 Wrocław Poland
Phone: +48-71-3209851, Fax: +48-71-3687105, e-mail: jszepiet@derm.am.wroc.pl

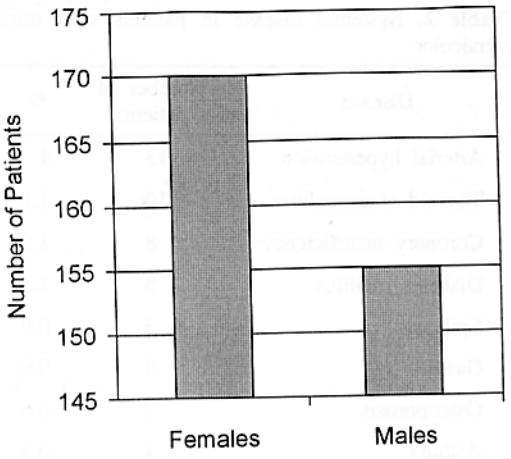

Fig. 1. Sex distribution of tinea versiclor (n=325)

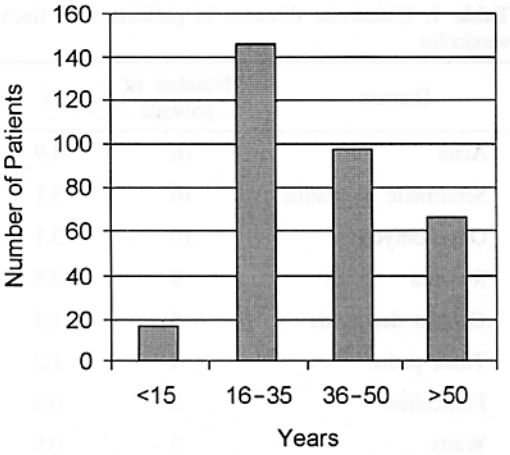

Fig. 2. Age distribution of tinea versicolor (n=325)

The disease is caused by dimorphic lipophilic yeast *Malassezia furfur*, a member of normal skin flora, which under predisposing factors invades the epidermis and colonizates in the stratum corneum[3].

Tinea versicolor is regarded as one of the most common dermatoses. Epidemiological studies suggested that 0.8～1.1% of general population is affected[4,5]. It constitutes about 3% of dermatological patients during summer periods[6]. Tinea versicolor is distributed throughout the world, and is especially common in tropical areas with high temperature and humidity, where its incidence is up to 40% of general population [7,8]. It is also very common in immunosuppressed patients[9]. Our previous study demonstrated that 33% of renal transplant recipients suffered from tinea versicolor[10].

The present study was undertaken to evaluate frequency of tinea versicolor among patients with fungal skin infections. Special attention was paid to sex and age distribution, as well as to the associated skin and systemic disorders.

MATERIAL AND METHOD

The study was planed as a prospective one and was carried out in Poland between January and December 1999. It was based on specially designed questionnaires with dermographic details of patients to be filled by dermatologists during the patient's examination. The clinical diagnosis of tinea versicolor was confirmed by yellow-orange Wood's lamp fluorescence and by direct mycological examination in 10～20% potassium hydroxide solution with addition of dimethyl sulfoxide (DMSO). Microscopy showing round budding yeast cells and hyphae ("spaghetti and meat balls" pattern) was characteristic for *Malassezia furfur*. Cultures were not performed, as it is generally accepted that the diagnosis of *Malassezia furfur* infection is based on typical direct mycology[1,2].

RESULTS

Total number of 2665 patients with mycologically confirmed fungal skin infections were analyzed. Tinea versicolor was diagnosed in 325 patients, which constituted 12.2% of all patients with different skin and nail infections. Tinea versicolor was slightly more common in female (52.3%) than in male patients (47.7%) (Fig. 1). The age of patients varied from 10 to 79 years, mean 36.1±15.3 years. Tinea versicolor was found in 45% of patients between the age of 16 and 35 and it was uncommon in children (5.2%) (Fig. 2). The duration of the disease

Table 1. Cutaneous diseases in patients with tinea versicolor

Disease	Number of patients	%
Acne	16	4.9
Seborrheic dermatitis	10	3.1
Onychomycosis	10	3.1
Rosacea	8	2.5
Contact dermatitis	5	1.5
Tinea pedis	4	1.2
Folliculitis	3	0.9
Warts	3	0.9
Atopic dermatitis	3	0.9
Psoriasis	2	0.6
Venous insufficiency with leg ulcer	2	0.6
Tinea cruris	1	0.3

Table 2. Systemic disease in patients with tinea versicolor

Disease	Number of patients	%
Arterial hypertension	13	4
Thyroid abnormalities	10	3.1
Coronary insufficiency	8	2.5
Diabetes mellitus	5	1.5
Epilepsis	3	0.9
Gastritis	3	0.9
Osteoporosis	2	0.6
Asthma	1	0.3
Multiple sclerosis	1	0.3

was 1 week to 23 years, mean 2.5±3.5 years. 161 patients (49.5%) were previously treated with different anti-fungal regimens. This treatment in almost all patients resulted in disappearance of the skin lesions, but recurrences occurred. There were not enough data available to analyze the duration of remission periods.

The majority of patients (81.2%) were from big towns (more than 100,000 inhabitants), only 4% lived in rural areas and the remaining 14.8% of patients were inhabitants of smaller towns. 147 patients (45.3%) finished general secondary school, 102 (30.3%) were after primary and professional technical schools and 76 (23.4%) had higher education.

Other cutaneous abnormalities were found in 67 patients (20.6%). They are presented in Table 1. Among them acne (4.9%), seborrheic dermatitis (3.1%) and onychomycosis (3.1%) were the most common ones. 47 patients (14.5%) suffered from systemic diseases (Table 2). Arterial hypertension (4%), thyroid abnormalities (3.1%), coronary insufficiency (2.5%) and diabetes mellitus (1.5%) were found to be the most frequently associated systemic diseases with tinea versicolor.

DISCUSSION

To the best of our knowledge the present study is one of the biggest prospective surveys on tinea versicolor. Our study demonstrated that tinea versicolor constituted 12.2% patients with fungal skin infections. Our previous epidemiological study, analyzing period between 1974 and 1991, showed that in south-west Poland the frequency of tinea versicolor among dermatomycoses was only 4.5%[11]. This might indirectly suggest the increase in the incidence of this disease during recent years.

It is generally accepted that male to female ratios are nearly equal[1,2], which was confirmed also by the present data, however Faergemann and Fredriksson[5] in their retrospective study reported that there was a 2 to 1 ratio of female to male patients.

Several authors described a variable age distribution of tinea versicolor, however the majority of cases occurred during adolescence and in young adults[1]. This is an agreement with our results showing 45% of infected patients between the age of 16 and 35. The special predisposition of this age group could be due to

hormonal changes and to increase in sebum secretion[1~3]. Therefore it was not surprising that acne was found the most common skin disease associated with tinea versicolor. The disease is rather uncommon in children, but the susceptibility in children is more prevalent that initially believed[1]. Studies showed that 4.9% to 7% of confirmed cases were children under the age of 13[12,13]. In our patient's group children up to the age of 15 constituted 5.2% of tinea versicolor patients.

Almost in half of our subjects recurrences were reported. This might suggest that recurrence is a common phenomenon in patients suffering from tinea versicolor. Tinea versicolor is considered as a chronic disease and one study revealed that the recurrence rate may be as high as 60% in the first year and 80% in the second year[14]. This is probably due to endogenous and exogenous predisposing factors that are still present after treatment. Moreover, *Malassezia furfur* could residue deep in the hair follicle and in these cases is very difficult to be completely eradicated[1]. The high rates of recurrences suggest the need for effective prophylaxis. The options include 400 mg ketoconazole once per month or 200 mg taken once a day for three days consecutively at the beginning of each month[15]. Borelli et al.[3] did not propose prophylactic treatment of tinea versicolor, as in their opinion, it is difficult to predict when recurrences occur. They suggested only prophylaxis for specially predisposed group of patients, such as immunocompromised individuals.

Faergemann and Fredriksson[5], both in their retrospective and prospective surveys, found that tinea versicolor was frequently associated with seborrheic dermatitis (10.3% and 10.4%, respectively). These percentages were much higher than expected. Seborrheic dermatitis is an eczematous reaction of not fully clear pathogenesis. It is proposed that *Malassezia furfur* could also play a role[16,17] and therefore the association between seborrheic dermatitis and tinea versicolor is of special interest. In our study seborrheic dermatitis occurred in 3.1% of tinea versicolor patients, being the second common associated dermatosis following acne. It is worth to mention that almost 1% of our patients suffered from folliculitis, which could also be caused by *Malassezia furfur*[18]. As laboratoral investigations were not performed in these patients it is impossible to clarify if folliculitis was due to bacterial or *Malassezia furfur* infection.

In 47 out of 325 our patients tinea versicolor occurred in association with systemic diseases. It is well known that several conditions are associated with an increased frequency of tinea versicolor. Among them adrenalectomy, Cushing's disease, diabetes, pregnancy, malnutrition, parenteral steroid therapy, immunosuppression, oral contraceptives and hyperhidrosis are regarded as the most important ones[3]. Our results showed high incidence of arterial hypertension, thyroid abnormalities and coronary insufficiency in patients with tinea versicolor. These associations are probably coincidental as the diseases mentioned above are common in general population. Diabetes mellitus, a predisposing factor to all types of infections, was diagnosed in 1.5% of tinea versicolor patients.

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