Common Difficulties in the Diagnosis and Therapy of Tinea in Patients Diagnosed in Dermatology Hospital in the Years 1981~2000

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Background: In the years 1981~2002 our department carried out a retrospective study of common difficulties in the diagnosis and therapy of tinea, over a 19 year period in Białystok.

Objective: The assessment of incidence of an inappropriate diagnosis and therapy of tinea and tinea incognito (TI) among patients treated at the Dermatology Hospital in Białystok in the years 1981~2000.

Material and Methods: All cases of tinea and TI diagnosed at the hospital were recorded in case records. All cases of tinea and TI were analyzed.

Results: We have identified the incidence of tinea in 1,045 patients (4.3% of all patients - 24,547). TI was diagnosed in 394 patients (37.7% of all patients with tinea). The most diagnostic-therapeutic problems were observed in the patients with tinea pedis, tinea corporis profunda and superficialis, tinea capitis profunda and superficialis, tinea of manum and pedis, tinea barbae profunda and onychomycosis. Before the patients admission to hospital, the following diagnoses were established: eczema, pyodermia, psoriasis, allergic dermatitis, allergisatio secondary. The misdiagnoses of tinea were made by pediatricians, general practitioners and dermatologists.

Conclusions: In our study we have demonstrated a high percentage of TI in comparison with all tinea patients. **[Kor J Med Mycol 2003; 8(3): 103-109]**

Key Words: Tinea, Tinea incognito, Steroids

INTRODUCTION

Dermatophyte fungi are capable of invading keratinized tissues (the stratum corneum of the skin, hair, nails). Taxonomically, these asexual fungi comprise 3 genera: *Microsporum*, *Trichophyton*, and *Epidermophyton*[1]. For clinical and epidemiological purposes, these fungi are grouped according to their ecological niche and classified as "geophilic", "zoophilic", and "anthropophilic". In humans, geophilic and zoophilic species tend to produce highly inflammatory lesions characterized by microabscesses and pustules. By contrast, anthropophilic species (*T. rubrum*), they usually cause mild lesions with little inflammation[1]. However, in patients with carcinoma, patients who have received renal transplants, and patients receiving systemic corticosteroid therapy, *T. rubrum* infection can be invasive[2,3]. Several underlying diseases and dis-

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orders such as diabetes mellitus, atopy, congenital ichthyosis, immunosuppressive drug therapy and HIV are known to predict a chronic course of dermatophytoses[4].

Tinea incognito (TI) describes an atypical dermatophyte infection usually as the result of inappropriate use of topical steroids[5~7]. It is important to take skin scrapings for microscopy and culture before beginning treatment with oral or topical antifungal agents.

The aim of this study was the assessment of incidence of an inappropriate diagnosis and therapy of tinea and tinea incognito (TI) in the patients hospitalized at the Dermatology Hospital in Białystok in the years 1981~2000.

MATERIAL AND METHODS

24,547 of case records of the patients aged 8~80 years hospitalized at the Dermatology Hospital in the years 1981~2000 were analyzed. We have determined number of patients treated due to different types of mycoses. The information recorded: diagnosis, clinical data, therapy, age, sex of each patient, skin, other disorders, place of living, and the speciality of doctor's. We used standard mycological procedures in the identification of fungi. The material was seeded directly into liquid Sabouraud glucose medium incubated at 37℃ for 24 h, and next agar culture was left at room temperature for a further 48 h. Direct preparations were then made of all the grown colonies, in 0.9% of sodium chloride, and then examined under a microscope for fungal structures. If such structures were detected, the culture was subcultured on Sabouraud glucose agar.

The diagnosis of TI was made by taking skin scrapings for microscopy and culture. We used the following criteria of TI:

- application of steroid creams
- a few days after stopping the steroid cream, the rash becomes very inflamed and more fungal elements may be seen on microscopy than usual.
- the responsible organism generally grew promptly in culture.

RESULTS

We identified the incidence of tinea in 1,045 of patients (4.3% of all patients - 24,547).

The highest number of the patients were hospitalized in the years 1982, 1981, 1984 and 1985, the lowest in 1996, respectively (Table 1).

TI was diagnosed among 394 patients (37.7% of all patients with tinea). The highest percentage of improperly diagnosed tinea was noticed in 1995 (68% of all tinea), 60% in 1996 and in 1999 (62.7%), respectively. Results are shown in Table 2.

The improperly diagnosed and treated tinea was observed among the patients from the village (51.5%), mainly in men (61.4%) with an age range of 31~50 years (32.5%) (Table 3).

The most diagnostic-therapeutic problems were observed among patients with tinea pedis, tinea corporis profunda and superficialis, tinea capitis profunda and superficialis, tinea of manum and pedis, tinea barbae profunda and onychomycosis (Table 4).

Before the patients admission to hospital, the following diagnoses were established: eczema, pyodermia, psoriasis, allergic dermatitis, allergisatio secondary (Table 5). Eight percentage of patients had an inadequate therapy (Table 5).

The misdiagnoses of tinea were made by pediatricians, general practitioners and dermatologists. The patients with an incorrect diagnosis of tinea had also allergisatio secondary, psoriasis and eczema (Table 6).

During hospitalization the mycological diagnosis of mycosis fixed in 56.6% already after the first mycological investigation, in 9.4% of patients at the

Table 1. Number of patients with tinea hospitalized at the Dermatology Hospital in the years 1981~2000

Years	Number of patients	Number of patients with tinea
1981	1275	88
1982	1381	103
1983	1430	67
1984	1389	85
1985	1398	84
1986	1412	72
1987	1350	48
1988	1464	63
1989	1140	34
1990	1148	33
1991	1409	52
1992	1284	47
1993	1058	37
1994	710	24
1995	995	25
1996	1177	15
1997	1201	22
1998	1078	25
1999	1204	51
2000	1044	70
Total	24547	1045 (4.3%)

Table 2. Number of patients with inadequate therapy of tinea before their admission to the Dermatology Hospital in the years 1981~2000

Years	Total number of patients	Number of patients with incorrect therapy (%)
1981	88	31 (35.2%)
1982	103	34 (33%)
1983	67	25 (37.3%)
1984	85	26 (30.6%)
1985	84	18 (21.4%)
1986	72	24 (33.3%)
1987	48	17 (35.4%)
1988	63	24 (38.1%)
1989	34	16 (47.1%)
1990	33	11 (33.3%)
1991	52	19 (36.5%)
1992	47	19 (40.4%)
1993	37	16 (43.2%)
1994	24	10 (41.7%)
1995	25	17 (68%)
1996	15	9 (60%)
1997	22	8 (36.4%)
1998	25	12 (48%)
1999	51	32 (62.7%)
2000	70	26 (37.1%)
Total	1045	394 (37.7%)

second and in 11.4% at third, respectively. Nearly 0.5% of tinea cases was diagnosed in Wood's lamp. In 22.1% of the patients was established tinea in spite of negative results of the direct examination and cultures. The good therapeutic response to antifungal agents was taking account in these cases (Table 7).

The most common clinical isolates were: *Trichophyton mentagrophytes*, *Trichophyton rubrum* and *Candida albicans*.

The inadequate therapies of the patients included topical and oral administration of corticosteroids (66.8%), topical and oral antibiotics (19.8%), antihistamics (14.2%) and other medicines such as ointment cod-liver oil, herbs, aloe, propolis, cosmetic creams (15.7%) (Table 8).

DISCUSSION

The most diagnostic-therapeutic problems was observed among patients tinea pedis, tinea corporis profunda and superficialis, tinea capitis profunda and superficialis, tinea manum and pedis, tinea barbae profunda and onychomycosis. In our study we have demonstrated a high percentage of TI in comparison with all tinea patients. TI was diagnosed in 37.7% of all patients with tinea. The most common clinical isolates were: *Trichophyton mentagrophytes*, *Trichophyton rubrum* and *Candida albicans*. We found many modified tineas by

antibiotics, antihistamins and other medicines similar to tinea incognito. The classical lesion of a dermatophyte infection is the ringworm. This is a round lesion whose rim is more inflamed and scaly than the center. Typically this form occurs in infection of the body, tinea corporis. Topical corticosteroids became available for use in 1952 when hydrocortisone was introduced. Modification of the basic corticosteroid molecule, e.g. by halogenation or the optimization of the vehicle, enhances their effectiveness, the former by raising the potency and the latter by increasing the percutaneous absorption[8]. In the British National Formulary, topical corticosteroids are graded according to their potency into four classes; mildly potent, e.g. hydrocortisone base or acetate 2.5%, moderately potent, e.g. hydrocortisone 17 butyrate 0.1%, potent, e.g. betamethasone 17 valerate 0.1%, and very potent, e.g. clobetasole propionate 0.05%. Topical corticosteroids have vasoconstrictive, anti-inflammatory and antiproliferative effect[9].

Table 3. Demographic data of patients with inadequate therapy of tinea (1981~2000) (N=394)

Sex	
Male	242 (61.4%)
Female	152 (38.6%)
Place of living	
City	191 (48.5%)
Country	203 (51.5%)
Range of age	
<2	1 (0.3%)
3~7	29 (7.4%)
8~14	46 (11.7%)
18~30	89 (22.6%)
31~50	128 (32.5%)
51~70	81 (20.6%)
>71	20 (5.1%)

Table 4. Types of tinea with most diagnostic-therapeutic problems observed in the patients before their admission to the hospital

Tinea	Number of patients (N=394)	Percentage of the inadequate therapy of tinea (%)
Tinea pedum	93	23.6
Tinea cutis glabrae superficialis	71	18
Intertrigo candidamycetica	48	12.2
Tinea profunda cutis glabrae	32	8.1
Tinea profunda capitis	26	6.6
Tinea superficialis capitis	21	5.3
Tinea manuum et pedum	19	4.8
Tinea profunda barbae	14	3.6
Tinea unguium pedum	12	3
Pitiriasis versicolor	9	2.3
Tinea unguium manuum et pedum	6	1.5
Paronychia candidamycetica	6	1.5
Tinea pedum et unguium pedum	5	1.3
Tinea superficialis capitis et cutis glabrae	5	1.3
Tinea unguium manuum	3	0.8
Tinea profunda capitis et cutis glabrae	3	0.8
Tinea inguinalis	1	0.3
Others	20	5.1

Cases of tinea treated by corticosteroids are known as tinea incognito or steroid-modified tinea[10]. Other local cutaneous side effects of topical corticosteroids include striae, atrophy, purpura, telangiectasia, pigmentary disturbances, reduced healing of wounds, folliculitis, acne, perioral dermatitis, rosacea, miliaria, hypertrichosis, milia and even allergic contact dermatitis[11,12].

In non systemic infections, local application of corticosteroids may modify the presentation of the anthropophilic dermatophyte infections. Tinea incognito may mimic a number of other dermatological conditions, including lupus erythematosus, contact dermatitis, psoriasis, and eczema, but also erythema migrans[5,11,13]. This variety in the clinical picture can delay proper diagnosis and treatment[14]. Tinea incognito is most likely produced by treatment with strong (fluorinated) steroids, especially when they are applied under occlusive dressings, but even application of 1% hydrocortisone cream can modify the presentation of tinea to a confusing extent[11].

In view of the patient's history of leisure activities, the lesions might have been caused by a broad range of organisms, including *Aeromonas* species, *Pseudomonas aeruginosa*, *Mycobacterium marinum*, and/or *Prothoteca* species. For this reason,

Table 5. Disorders diagnosed as tinea

Disorders	Number of patients (N=394)	Percentage of the inadequate therapy of tinea (%)
Eczema	115	29.2
Pyodermia	62	15.7
Psoriasis	47	11.9
Dermatitis allergica	47	11.9
Allergisatio secondary	22	5.6
Casus pro diagnosis	10	2.5
Dermatitis seborrhoica	8	2
Contact dermatitis	8	2
Scabies	4	1
Alopecia	4	1
Impetiginisatio secundaria	4	1
Pitiriasis Rosea Gibert	3	0.8
Others	28	7.2

Table 6. Concomitant disorders of the patients with tinea

Disorders	Number of patients (N=137)	Percentage of concomitant disorders (%)
Allergisatio secondary	61	44.5
Psoriasis	16	11.7
Eczema	15	11.2
Diabetes mellitus	11	8
Ulcera cruris	11	8
Others	23	16.8

Table 8. Therapies of tinea

Methods of therapy	Number of patients (N=394)	Percentage of the inadequate therapy of tinea (%)
Corticosteroids	263	66.8
Antibiotics	78	19.8
Antihistamins	56	14.2
Other agents	62	15.7
Surgery	5	1.3

Table 7. Mycological methods of the laboratory diagnosis of tinea

Mycological methods	Number of patients (N=394)	Percentage (%)
First direct examination	223	56.5
Second direct examination	37	9.4
Culture with negative direct examination	45	11.4
Wood's lamp	2	0.5
Diagnosis after administration of antifungal agents	87	22.1

a biopsy specimen for culture, although simple microscopic examination of potassium hydroxide preparations of skin scrapings will usually point to the diagnosis of fungal infection[11,13,15]. In tinea incognito, however, the classic appearance is altered by previous treatment with oral or topical corticosteroids, a prominent scaling border is not visible. In such cases, accurate diagnosis requires a high index of suspicion[2,15].

Romano et al.[17], reported three children with tinea incognito in whom the lesions were psoriasis-like, eczema-like, and lichenoid, respectively. Diagnosis was confirmed by mycological examination, which led to the identification of *Microsporum gypseum*, a geophilic dermatophyte which is an infrequent agent of mycotic infection in humans.

Majocchi granuloma was described naturally in situations of occlusion and later from superficial trauma such as shaving. More recently, the disease has occurred in the immunocompromised patient. Iatrogenic disease (tinea incognito) is a new and more subtle form[18].

In conclusion, we have demonstrated a high percentage of inappropriate therapy of tinea and tinea incognito among patients hospitalized during 1981~2000. We have noticed different modalities of tinea therapy which often caused misdiagnoses of this disease. Better strategies are required to educate physicians and dermatologists to reduce the incidence of inappropriate diagnosis and therapy of tinea.

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