Brief Report

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Clinical features of 80 cases of tinea faciei treated at a rural clinic in Japan

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Summary **From March 2008 through February 2014, 80 patients aged 1-95 years (43 men and 37 women) were diagnosed with tinea faciei by a rural Japanese clinic. The affected sites were the cheek in 42 patients (52.5%), the auricles and area surrounding the auricles in 16 (20.0%), and the mandible in 12 (15.0%); 33 patients (41.2%) had concurrent ringworm in areas other than the face. Twenty-one patients (26.3%) had applied topical steroids to treat a rash. The pathogen responsible for tinea faciei was *Trichophyton rubrum* in 35 patients (43.7%), *T. tonsurans* in 19 (23.8%), *T. mentagrophytes* in 3 (3.8%), *T. verrucosum* in 2 (2.5%), *T. violaceum* in 2 (2.5%), *Microsporum canis* in 17 (21.3%), and *M. gypseum* in 2 (2.5%). Clinical symptoms were divided into three groups based on the severity of inflammation and the extent of lesions and scored in points. Anthropophilic dermatophytes resulted in a score of 1.82 points for the severity of inflammation and a score of 1.84 points for the extent of lesions while zoophilic dermatophytes resulted in a score of 2.14 points for the severity of inflammation and a score of 1.50 points for the extent of lesions. This indicates that anthropophilic fungi resulted in less inflammation and broader lesions, whereas zoophilic fungi resulted in more intense inflammation and smaller lesions. Patients who had applied topical steroids had a mean score of 1.90 points for the severity of inflammation and a mean score of 2.10 points for the extent of lesions. Patients who had not applied topical steroids had a mean score of 1.95 points for the severity of inflammation and a mean score of 1.59 points for the extent of lesions. The severity of inflammation did not differ significantly. However, lesions were significantly broader in patients who had applied topical steroids than in those who had not applied topical steroids ($p < 0.04$). The severity of tinea faciei is a useful index for the clinical diagnosis of tinea faciei.**

Keywords: Clinical features, dermatophytes, dermatophytosis, ringworm, tinea faciei

1. Introduction

Tinea faciei is a rare dermatophyte infection occurring in the glabrous skin of the face, excluding the moustache and beard areas in men (*1*). Although ringworm of the face is classified as tinea corporis in Japan, it is often called tinea faciei (*1,2*). Tinea faciei is often difficult to diagnose because of the severe inflammatory lesions caused by zoophilic fungi and an atypical clinical appearance as a result of topical steroid use (*1*). Eighty cases of tinea faciei were encountered over the last 6 years at a rural Japanese clinic. Here, the clinical features of these cases have been evaluated by scoring the severity of inflammation and the extent of lesions.

2. Materials and Methods

Eighty patients with tinea faciei were seen by this clinic from March 2008 through February 2014. Tinea faciei was diagnosed by direct microscopic examination using Parker ink KOH staining. Pathogens were identified

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by fungal cultures. During the period studied, 10,575 patients with dermatophytosis were seen, accounting for 8.7% of 121,038 outpatients (new patients). Eighty-five patients with tinea faciei accounted for 0.80% of all patients with tinea; the pathogens responsible for that tinea were identified in 80 patients (94.1%).

Specimens were cultured in Sabouraud's cycloheximide chloramphenicol agar at 25°C, and pathogens were identified based on mycological findings. A hairbrush culture (96 spikes) was performed in cases where concurrent tinea capitis was suspected (*3*).

Clinical symptoms were divided into three groups based on the severity of inflammation and the extent of lesions and these symptoms were scored in points. The severity of inflammation was determined as follows: scaly plaque-like lesions with mild inflammation, 1 point; typical "ringworm" lesions with an annular appearance, 2 points; and vesicular or exudative lesions with intense inflammation, 3 points. The extent of lesions was determined as follows: lesions < 3 cm in diameter, 1 point; lesions 3-6 cm in diameter, 2 points; and lesions > 6 cm in diameter, 3 points. The Kruskal-Wallis and Mann-Whitney tests were used for statistical processing and a $p < 0.05$ was considered to represent a significant difference.

Patients with multiple lesions or tinea capitis were also given oral terbinafine hydrochloride or itraconazole. Patients with tinea unguium or tinea capitis caused by *Trichophyton tonsurans* received pulsed treatment in 4-week cycles. One cycle consisted of oral medication given for 1 week followed by a 3-week respite. Topical medication was applied until the end of treatment. Therefore, the duration of topical application was the same as the treatment period.

3. Results and Discussion

Patients were 43 men and 37 women aged 1-95 years (mean: 42.8 ± 27.7 years). Of the patients, 31 (38.8%) were < 19 years of age, 21 (26.3%) were 20-59 years of age, and 28 (35.0%) were ≥ 60 years of age. The affected sites were the cheeks in 42 patients (52.5%), the auricles and area surrounding the auricles in 16 (20.0%), and the mandible in 12 (15.0%). Thirty-three

Figure 1. Case 1. The patient had applied a topical steroid to treat a rash. The pathogen responsible for tinea faciei was *Trichophyton rubrum*. Erythematous plaque provided evidence to rule out discoid lupus erythematosus. The severity of inflammation was 1 point, and the extent of the lesion was 2 points.

Figure 2. Case 2. The patient was a 14-year-old judo practitioner. The pathogen responsible for tinea faciei was *Trichophyton tonsurans*. The patient had scaling erythema with infiltration on his left cheek. The severity of inflammation was 3 points, and the extent of the lesion was 1 point.

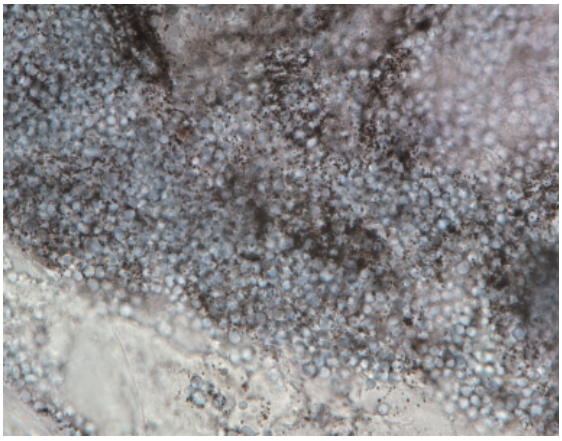

Figure 3. Direct microscopic examination revealed endothrix infection with chains of conidia in and around the hair.

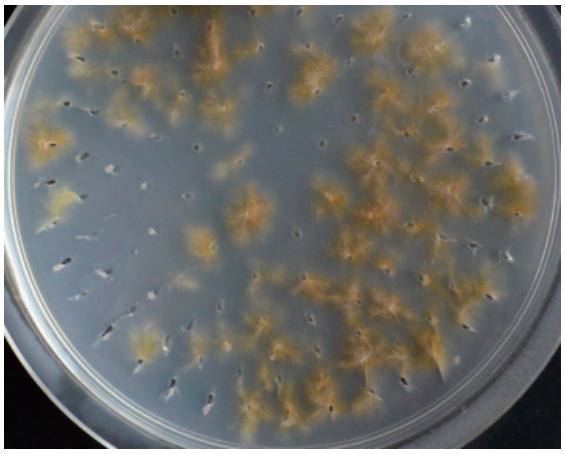

Figure 4. A sample, obtained with a circular hairbrush, was cultured and produced brownish-yellow colonies with powdery surfaces.

Table 1. Clinical Features of Tinea Faciei by Pathogen

Theme	Case	Male/female	Age	Concurrent other type of tinea	Hairbrush test positive	Steroid-modified	Inflammation (score)	Extent (score)	Internal dosing (wks)	Topical application (wks)	Recurrent case
Anthropophilic	56	40/16	42.4	19	10	13	1.82	1.84	2.9	4.9	5
T. rubrum	35	22/13	59.3	16	1	13	1.74	2.29*	2.4	5.3	4
T. tonsurans	19	18/1	15.3	7	8	0	1.95	1.11*	3.9	3.9	1
T. violaceum	2	0/2	3.5	0	1	0	2.00	1.00	2.0	6.5	0
Zoophilic	22	2/20	41.8	8	4	7	2.14	1.50	2.1	5.0	2
T. mentagrophytes	3	1/2	25.0	0	0	1	2.33	1.67	0.7	5.0	0
T. verrucosum	2	0/2	29.5	0	0	1	2.00	1.00	0.5	5.5	0
M. canis	17	1/16	46.1	8	4	5	2.12	1.53*	2.5	4.9	2
Geophilic											
M. gypseum	2	0/2	66.5	0	0	1	3.00	1.00	5.0	6.0	0
Steroid-modified case	21	9/12	54.0	8	3	–	1.90	2.10**	3.4	6.0	1
Non-modified case	59	34/25	38.8	25	11	–	1.95	1.59**	2.5	4.6	6
Total or mean	80	43/37	42.8	33	14	21	1.94	1.73	2.8	4.9	7

* $p < 0.001$ compared with 3 groups; ** $p < 0.05$ compared with 2 groups.

patients (41.2%) had concurrent ringworm in areas other than the face, and 14 (17.5%) had a hairbrush culture that tested positive for a pathogen. Twenty-one patients (26.3%) had applied topical steroids to treat a rash. The pathogen responsible for tinea faciei was *Trichophyton rubrum* in 35 patients (43.7%), T. *tonsurans* in 19 (23.8%), *T. mentagrophytes* in 3 (3.8%), *T. verrucosum* in 2 (2.5%), *T. violaceum* in 2 (2.5%), *Microsporum canis* in 17 (21.3%), and *M. gypseum* in 2 (2.5%). In all three patients with *T. mentagrophytes*, the teleomorph *Arthroderma vanbreuseghemii* was molecularly identified. Pathogens responsible for tinea faciei vary; the primary pathogens are reported to be *T. tonsurans* in the United States (*4*), *M. canis* in Italy (*5*), and *T. verrucosum* in Macedonia (*6*). The primary pathogen responsible for tinea faciei in Japan is *T. rubrum*, but seven species of pathogens were identified in the current study. Tinea faciei is easily misdiagnosed because of its various clinical symptoms. Tinea must be differentiated from other diseases including discoid lupus erythematosus (DLE), polymorphous light eruption, psoriasis, impetigo, rosacea, and seborrheic dermatitis (*1*). Thirty-three patients (41.2%) had typical annular lesions, resulting in a score of 2 points for the severity of inflammation, whereas most patients (58.7%) had atypical lesions, resulting in a score of 1 point and 3 points.

Two typical cases will now be presented. The disease in Case 1 was difficult to diagnose since the disease's clinical appearance had been modified by topical steroid use, while the disease in Case 2 should be considered an emerging infectious disease in Japan. Case 1 involved a 64-year-old woman who had applied topical steroids to treat a rash. The pathogen responsible for tinea faciei was *T. rubrum*. The patient had erythematous plaque from her nose to her left cheek (Figure 1). The clinical appearance ruled out DLE. The severity of inflammation was 1 point, and the extent of the lesion was 2 points. Case 2 involved a 14-year-old judo practitioner who had scaling erythema with infiltration on his left cheek (Figure 2). Incomplete alopecia with several black dots was visible on the occipital scalp. Direct microscopic examination revealed endothrix infection with chains of conidia in and around the hair (Figure 3). A sample, obtained using a circular hairbrush, was cultured and produced brownish-yellow colonies with powdery surface (Figure 4). The results of culturing supported a diagnosis of tinea faciei caused by *T. tonsurans*. The severity of inflammation was 3 points, and the extent of the lesion was 1 point. *T. tonsurans* infection has mainly been reported among judo practitioners since 2001 and has now spread to junior and senior high school judo practitioners in rural areas (*7*). In the current study, 19 patients with a *T. tonsurans* infection were all teenaged judo practitioners. This Clinic keeps in contact with judo instructors and this Clinic uses a hairbrush culture to periodically examine students for infection. The treatment period for tinea faciei caused by *T. tonsurans* is short because treatment is administered in an early stage.

Table 1 summarizes the clinical features by pathogen. The mean score for the severity of inflammation was 1.94 points and that for extent of lesions was 1.73 points. The corresponding scores were 1.74 and 2.29 points for *T. rubrum*, 1.95 and 1.11 points for *T. tonsurans*, and 2.12 and 1.53 points for *M. canis*, respectively. The mean scores for the severity of inflammation and the extent of lesions were 1.82 and 1.84 points for anthropophilic dermatophytes (*T. rubrum*, *T. tonsurans*, and *T. violaceum*) and 2.14 and 1.50 points for zoophilic dermatophytes (*T. mentagrophytes*, *T. verrucosum*, and *M. canis*), respectively. These findings indicate that anthropophilic fungi resulted in less inflammation and broader lesions, whereas zoophilic fungi resulted in more intense inflammation and smaller lesions. When a small area of erythema (< 3 cm) with intense inflammation was observed on the face, ringworm

caused by zoophilic fungi had to be considered and patients were asked if they had contact with animals. Patients who had applied topical steroids had a mean score for the severity of inflammation of 1.90 points and a mean score of 2.10 points for the extent of lesions. Patients who had not applied topical steroids had a mean score for the severity of inflammation of 1.95 points and a mean score of 1.59 points for the extent of lesions. Mean scores for the severity of inflammation did not differ significantly. However, lesions were significantly larger in patients who had applied topical steroids ($p = 0.026$). Diagnosing tinea faciei based on clinical symptoms is hampered by misuse of topical steroids and the presence of numerous zoophilic fungi causing intense inflammatory symptoms. In addition, the presence of various fungal strains is an important factor to consider. Therefore, scoring the symptoms of tinea faciei is considered to be a useful approach for the clinical diagnosis of tinea faciei.

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