Epidemiology and identification of organisms causing superficial dermatomycoses at tertiary hospitals in Korea: a prospective multicenter study

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Background & Objectives

• Superficial dermatomycoses are very common diseases in the dermatologic field. However, their prevalence and clinical characteristics vary with geographical areas and populations. Moreover, pathogenic species change constantly over time.

→ This **multicenter study** was undertaken to investigate the **epidemiologic** and **clinical findings** of **superficial dermatomycoses** in Korea during the period of 2016-2017.

→ We sought to identify the **pathogenic organism** causing the three different kinds of fungal infections; tinea corporis, tinea faciale, and tinea capitis.

Methods

• Patients with clinically suspected superficial dermatomycoses were checked using KOH examination to identify the presence of fungi.

• Patients with positive KOH examination result were included and they completed a case report to acquire **epidemiologic information**: age, sex, past history of comorbidities, family history of dermatomycoses, occupation, suspected route of infection, clinical diagnosis.

• **Mycologic evaluations** were conducted in patients with T. corporis, T. faciale, and T. capitis.

→ Collected samples were cultured on two sets of potato dextrose agar corn meal tween 80 media. Cultured medias were incubated at room temperature for at least 4 weeks. When there was difficulty in identifying the organism, molecular biology methods using polymerase chain reaction (PCR) or PCR-Reverse Blot Hybridization Assay were performed.

Results

1. Patient demographics

• Total of 453 patients who confirmed superficial dermatomycoses by KOH examination were enrolled.

• Male were more predominant (275, 60.7%) than females (178, 39.3%) and the mean age was 51.4 ± 20.9 (range, 9 months to 92 years).

Figure 1. Age distributions in patients

• **Tinea capitis** was the most common infection in children less than 10 years of age, **tinea pedis** had two peak incidences at 40-49 and 70-79 years, and **tinea corporis** and **tinea faciale** were predominant in the 50-59-year age group. **Tinea unguium** most commonly occurred in the 60-69-year age group.

2. Patient clinical characteristics

Figure 2. Past history of comorbidities

• In terms of past history, **53.4% (214/401)** of patients had at least one comorbidity. **Hypertension** (108/401, 26.9%) was the most common comorbidity, followed by **diabetes mellitus** (64/401, 16.0%), **malignancy** (28/401, 7.0%), **liver disease** (24/401, 6.0%), and **dyslipidemia** (20/401, 5.0%).

• Among patients with comorbidities, **tinea corporis** (97/212, 45.8%) was the most common disease, whereas **tinea pedis** (77/238, 32.4%) was the most common among patients with no previous comorbidities.

Figure 3. Family history of dermatomycoses

• **Family history of dermatomycoses was positive in 68 (15.0%) patients.** The most common infected family member was the **father** (24/68, 35.3%), followed by the **son** (14/68, 20.6%), **mother** (11/68, 16.2%), and **husband** (9/68, 13.2%).

• **For occupations**, 177 patients (41.3%) were **non-workers**, 59 (13.8%) were **office workers**, 40 (9.3%) were **housewives**, 27 (6.3%) were students, and 23 (5.3%) were farmers.

Figure 4. Diagnosed types of dermatomycoses

• **Tinea corporis** (161/590, 27.3%) was the most common type of superficial dermatomycoses, followed by **tinea pedis** (137/590, 23.2%), **tinea unguium** (toe) (84/590, 14.2%), **tinea cruris** (78/590, 13.2%), **tinea faciale** (52/590, 8.8%), and **tinea capitis** (36/590, 5.6%).

• The majority of patients (297/442, 57.4%) were **not aware of the route of infection**, but 72 patients (16.3%) speculated that they had been infected from **their own onychomycosis**, 21 patients (4.8%) from their **cat**, another 21 patients (4.8%) from their **dog**, 20 patients (4.5%) from another member of their family, and 11 patients (2.5%) from the soil.

3. Mycologic evaluations

• In the 80 isolated cases of **tinea corporis**, **Trichophyton rubrum** was the most common (68 cases, 66.7%), followed by yeast in five (4.9%).

• In the 23 isolated incidences of **tinea faciale**, **Trichophyton rubrum** were present in 14 cases (43.8%), **Microsporum canis** in four (12.5%).

• In the 23 isolated incidences of **tinea capitis**, **Microsporum canis** were present in 11 cases (36.7%), **Trichophyton rubrum** in eight (26.7%), yeast in two (6.7%).

Discussion & conclusion

• In tertiary hospitals of Korea, superficial dermatomycoses were **more common in male** than female patients.

• **More than half** of the patients had at least one **comorbidity**.

• Previous studies, as well as this investigation, have reported **Trichophyton rubrum** as the **most common infectious agent of tinea corporis and faciale**, and **Microsporum canis** as the **most common agent of tinea capitis**, in Korea.

• We found that the **proportion of tinea faciale that was caused by Microsporum canis increased**, relative to previous studies. Because **Microsporum canis** is the most common dermatophyte in cats and dogs, so we suspected that an increase in house pets influenced this difference.

• This study will contribute to the treatment and management of superficial dermatomycoses by identifying the epidemiology and causative organisms of superficial dermatomycoses in Korea.