CASE REPORT/CAS CLINIQUE

Familial cases of Microsporum canis tinea in Adana, Turkey

Cas familiaux de teigne à Microsporum canis à Adana, Turquie

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Summary Tinea capitis is uncommon in the Cukurova region of Turkey. The most common clinical form is tinea capitis superficialis, and the most frequent causative agent is Trichophyton violaceum. This study presented the results of a screening performed at the family background of a kerion Celsi case in Adana, Turkey, with the aim of determining the infection source and the route of transmission. Tinea capitis superficialis was detected in the two siblings of the index case, with tinea faciei in one sibling. It was also detected in two children who were playmates of the siblings in the Mersin province. Microsporum canis was isolated in all of the cases. However, we did not have access to animals in order to obtain fungi for determining the actual source of infection. In conclusion, this study presented an outbreak of M. canis in a family, with clinical presentations different from kerion Celsi, tinea capitis superficialis and tinea faciei.

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MOTS CLÉS
Teignes; Microsporum canis; Épidémiologie

Résumé Tinea capitis est une infection rare dans la région de Cukurova en Turquie. La forme clinique la plus commune est celle des teignes superficielles et l’agent causal le plus fréquent est Trichophyton violaceum. Cette étude a présenté les résultats d’une enquête effectuée dans le contexte d’un cas de Kéron de Celse dans une famille à Adana, Turquie, avec le but de déterminer la source d’infection et la voie de la transmission. Des teignes superficielles ont été détectées parmi deux enfants de mêmes parents du cas d’index, avec une dermatophytie faciale dans un enfant de mêmes parents. Tinea capitis a été également détecté dans deux

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** This study presented the results of a screening performed at the family background of a kerion Celsi case in the Adana province, Turkey, with the aim of determining the infection source and the spreading status.
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Introduction

Tinea capitis is a dermatophyte infection of the scalp. The condition is generally observed in children over the age of six years and before puberty. It has three main clinical forms: namely tinea capitis superficialis (TCS, noninflammatory form), tinea capitis profunda (inflammatory form, kerion Celsi) and tinea capitis favosa (favus) [10]. The first was associated with anthropophilic dermatophytes, *Microsporum audouinii*, *Trichophyton tonsurans* and *T. violaceum*, and zoophilic *M. canis* vary from region to region [3]. Kerion Celsi is most commonly associated with zoophilic *T. verrucosum* and *M. canis* or geophilic *M. gypseum* [1,3,7,8,10,12]. The favus type has been described with anthropophilic *T. schoenleinii*, but may also occur with *T. violaceum*, *T. verrucosum* or *M. gypseum* [1,7,8,10]. The signs and symptoms will vary depending upon several factors including the causative organism and the host immune response. Tinea capitis also may present as a minimal infection, termed carrier state. Asymptomatic carrier is defined as an individual, who has dermatophyte-positive scalp culture without signs or symptoms of tinea capitis, generally due to anthropophilic fungi, i.e., *T. tonsurans* and *T. violaceum* [3,10].

Participants and methods

Kerion Celsi case and the family

An eight-year-old boy was presented at the dermatology polyclinic of the Adana Social Security Hospital, with a severe inflammatory lesion with swelling and abscess was referred to the Mycology Laboratory, Faculty of Medicine, Cukurova University. The family of the patient had moderate financial income, and two years ago had immigrated to the region from the Batman province, located in the southeastern Anatolia region. The family consisted of the mother, the father and four children, and all were residing in the same dwelling. The patient’s other three siblings reported similar complaints and were then invited for mycological examination, in addition to the investigation of parents for scalp, glabrous skin and nail dermatophytoses (Figure 1). Besides, inanimate objects at the dwelling of the cases were analysed in terms of dermatophyte fungi. Samples were taken from five pillowcases, three blankets, three sheets, two sofas and one comb.

 Relatives in Mersin province

It was also reported that, on some occasional weekends, the four siblings had visited the dwelling of their relatives with 10 children living in the Mersin province, 60 km west of Adana.

Diagnosis

The diagnosis was made on a clinical evidence of tinea capitis with broken hairs and/or alopecia. After cleaning the lesion with 70% alcohol, the broken hair stumps near the advancing border of the lesion epilated with a flat-edged tweezer and scale scrapings using a no 15 scalp blade were collected into sterile paper packets. A portion of each sample was mounted in 50 μl of 15% potassium hydroxide (KOH) solution and examined microscopically for the presence of fungal elements. The remainder of each specimen was inoculated onto agar slants of Sabouraud glucose agar (SGA, Acumedia, Baltimore, Maryland, USA), potatoe dextrose agar (PDA, Merck, Darmstadt, Germany) and mycobiotic agar (Difco Laboratories, Detroit, MI, USA). For diagnosis of tinea faciei, surface scrapings were obtained from the border of the lesion, where there were more fungal elements, and then clinical samples were examined by direct microscopy with KOH and fungal culture.

Identification of dermatophyte species

The cultures were incubated at 25 ℃ in air and were examined after seven, 14, and 21 days for evidence of growth. Fungal isolates, if any, were subcultured onto SGA and PDA in Petri dishes. Identification of *M. canis* was performed by observation of gross colony characteristics, growth in rice grains and the presence of typical spindle shaped rough macroconidia with knoblike ends in lactic acid cotton blue preparation [5,19].

Figure 1 A wide, sharply margined, single-lesioned case of Kerion celsi in an eight-year-old boy (right); and his sibling, a 10-year-old, with Tinea capitis superficialis (left); both caused by *M. canis*. 

Figure 1 Kérion de Celse large, unique, nettement marginé chez un garçon de huit ans (à droite); son frère agé de dix ans avec Tinea capitis superficielle (à gauche), les deux lésions sont dues à *M. canis*.
Results

*Microsporum canis* was isolated in the single case of kerion Celsi, four cases with TCS, and in the single case of tinea faciei; resulting with a total of six cases.

Kerion Celsi case and the family

TCS was detected in two brothers of the kerion Celsi case and tinea faciei in one sister (Figure 2). Cervical lymphadenopathy was diagnosed only in the index case. Dermatophytids on the palms and the sides of the fingers characterized by vesicular lesions were not found in any of the cases. While brilliant yellow-green fluorescence was present in three tinea capitis cases in Wood’s light examination, it was not observed in the tinea faciei case. Direct microscopic examination was positive in all siblings, and *M. canis* was isolated in all of them (Table 1). All the children had comb sharing and cosleeping. The family reported no pet in the house and that children had no contact with animals, except the boy with kerion Celsi. Parents were free of dermatophytoses. All environmental sites such as pillowcases, blankets and sheets were negative for dermatophyte.

Relatives in Mersin

Relatives in Mersin province had a common dwelling with cat as a pet. The family reported that all children played with the cat. Out of the 10 children living in the house, two had TCS—aged nine and 11 years with positive Wood’s light, and the causative agent was *M. canis*. However, the parents reported that the cat had died some time ago. For that reason, we could not get any sampling from the cat.

Discussion

*Microsporum canis* remains the dominant cause of tinea capitis in most of Europe [3,10]. It still remains as one of the main causes of urban mycozoonoses and as a serious epidemiological problem due to a high degree of infectivity [4]. This species requires an animal reservoir because it loses its virulence after approximately four human-to-human transmission [10]. Although infections caused by *M. canis* may involve a variety of animals as host, the predominant carriers are known to be cats and dogs [3,10,14]. Despite the fact that household pets are considered as a common source of infection, yet feral pets are also regarded as another prolific source for this fungus [16]. Fomites or other inanimate objects associated with keratinous material from the animal may play a significant role in the acquisition of infections [14,15,20].

Recently, nosocomial spread of dermatophytose, in particular *M. canis*, although rare, has been reported [13,17,18]. Snider et al. [18] reported nosocomial dermatophyte infections caused by *M. canis* in six neonates and identified a nurse as a common source. Shah et al. [17] also detected a nosocomial outbreak of tinea corporis caused by *M. canis* primarily involving elderly patients in chronic care setting and suggested the modes of transmission as human-to-human transmission, handling of contaminated laundry, and use of a shared razor. Similarly, Mossovitch et al. [13] reported an infant who acquired *M. canis* tinea capitis from nursery personnel. Although *M. canis* was isolated in the cases of all these studies, mentioned above, no demonstrable link was established to an infected animal; the cases resulted from human-to-human spread and fomites. In addition, as stated above, all the surveys suggesting an inter-human transmission of *M. canis* by hands or contaminated instruments were conducted in neonates and elderly populations. In both populations, quality of the skin was modified by immaturity or dryness.

In line with these reports, in their study, Aksungur et al. [2] stated that the sources of *M. canis* tinea capitis outbreak could not be determined in a nursery in Erzurum, Turkey. Gordon and Simpson [9] isolated *M. canis* as a causative agent of tinea corporis from six girlfriends, all aged 18 years, following a holiday on the Canary Island of Gran Canaria.
The cases also had befriended a cat and her kittens. However, mycological specimens were unobtainable from the cat’s interior. Yu et al. [21] detected contact plates from the car’s interior. In their study, they observed TCS in 40 children, and one of the infections was caused by Microsporum canis.

In their rather detailed study on M. canis infections, Brajac et al. [4] reported tinea capitis to be more prevalent in males by 58.4% versus 41.6% in females. However, tinea corporis affected females (70.8 versus 29.2%) more frequently than did males. The authors also recorded the face and neck as the most common sites of glabrous skin. Similarly, Inci et al. [11] also confirmed that M. canis tinea capitis was more prevalent in males (68.4 versus 31.2%) than in females. However, tinea corporis affected females more frequently (51.6 versus 48.4%). They also concluded that the higher prevalence of tinea capitis in males was due to a relatively more frequent males’ outdoor activities, thus enabling them to be more prone to contact with dermatophyte spores, in addition to their short hair facilitating the development of infection.

In this present study, a research carried out to detect the infection source in the family of a kerion Celsi case caused by M. canis (Figures 1 and 2). We screened all the members of the households, as well as their relatives living in the Mersin province. All the children had contact with the presumably ill cat during weekend time they spent with their family in Mersin. So a direct infection from this cat is a stronger possibility as it is usual. Moreover, we did not obtain any dermatophyte fungi from any inanimate objects nor from any other animal detected as a M. canis carrier. In parallel to literature [4,11], among a total of five cases with tinea capitis being all boys, and one case with tinea faciei was girl (Table 1).

As a conclusion, this study presented an outbreak of M. canis in a family, however the clinical pictures of infections varied from a mild hair loss to a severe inflammatory lesion as well as tinea faciei. The usefulness of determining the source of infection, especially in case of familial outbreak, was also underlined. Although we were not able to identify the actual causes of the infection, relying on our findings, we can suggest that the transmission could have originated from the cat.

To prevent the spread or recurrence of zoophilic fungi, it is important to identify potential sources of infection as well as to understand why an outbreak occurred, if the outbreak is ongoing and how to prevent others from being infected [16,21]. Household pets with suspected dermatophytoses should also be given treatment [16]. Moreover, collaboration of dermatologists, clinical microbiologists and veterinarians is of extreme significance.

References