Journal of Medical Microbiology (2007), **56**, 1122–1123 **DOI** 10.1099/jmm.0.47000-0

Case Report

Tinea pedis and tinea unguium in a 7-year-old child

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Received 12 October 2006
Accepted 26 March 2007

This report documents tinea pedis and tinea unguium in a 7-year-old child. In all cultures *Trichophyton rubrum* was present. As tinea pedis and tinea unguium affect adults more often than children, they might be overlooked and misdiagnosed in the latter.

Case report

A 7-year-old white boy had a 6 year history of itching, scaling and erythematous interdigital tinea pedis. His lesions appeared pruritic and inflamed, especially those located on his feet and between his toes; treatment with unspecific topical agents was unsuccessful. He presented longitudinal white striae with ungual fragility on the third right toenail. Family history did not reveal remarkable findings, except for a long lasting plantar hyperhidrosis. The child's father also had pruritic bullae on his right plantar surface; direct microscopic examination and culture confirmed tinea pedis.

Medical examination of the child's right foot revealed a scaling lesion, slightly erythematous in the third and fourth interdigital spaces, while the third right toenail showed longitudinal white striae with initial onycholysis (Fig. 1). During scraping of the area, an increase of ungual fragility was detected. The clinical picture suggested a fungal infection.

Different samples surrounding the active border of the lesions were obtained from the child at the Medico-Surgical Discipline Department, Dermatological Clinic II, San Lazzaro Dermatologic Hospital, University of Turin. Cutaneous samples were collected by gently scraping the lesions, while ungual specimens were collected by scraping the distal portion of the affected nail, the nail plate, as well as the nail bed, using a sterile scalpel. Before taking any further samples, the area was swabbed with distilled water and soap so as to remove any medication that might have been applied and could still have been present.

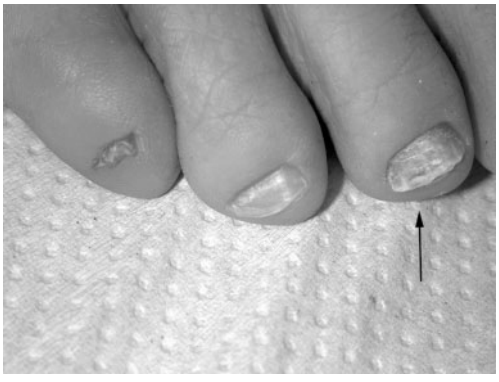

Fig. 1. Tinea unguium. Longitudinal white striae with a beginning of onycholysis.

All the specimens were placed in a drop of potassium hydroxide solution (10 %) on a glass slide, and examined under a microscope to detect any fungal hyphae. Cultures were performed with the remaining samples using Mycobiotic agar medium (Biolife) and Sabouraud dextrose agar (Biolife), and kept at 25 °C for 15 days. Potassium hydroxide examination of the nail and skin scrapings was positive for branching septate hyphae, and fungal culture was predictive of dermatophyte growth. After a preliminary diagnosis, fungal cultures were sent for final identification to the Mycology Laboratory, Department of Public Health and Microbiology, University of Turin.

The macroscopic aspect of the colony found on the Mycobiotic agar medium appeared typically white and cottony, with a red-wine colour on the reverse of the colony. Furthermore, branched, hyaline, septate, racket-like and chandelier-like hyphae were observed during microscopic examination; several droplet-like microconidia formed along the length of the hyphae and no macroconidia were observed. Both direct microscopic and macroscopic examination allowed the identification of *Trichophyton rubrum*.

Tinea pedis and tinea unguium are two highly prevalent cutaneous fungal infections in the adult population; they are relatively rare in young children (under 10 years) (Fernandes *et al.*, 2001; Lange *et al.*, 2004; Neri *et al.*, 2004). It has to be underlined that when these infections do occur in children they are often misdiagnosed (Geary & Lucky, 1999). In fact, in the juvenile age group many dermatoses observed in the feet and toenails are associated with dyshidrosis, eczematoid dermatitis, psoriasis, hyperhidrosis, lichen planus and traumatic diseases (Guenst, 1999).

Initially, in children, tinea pedis could be mistaken for one of the dermatoses described above and hence wrongly treated. Consequently it could develop into a chronic lesion favouring ungual infection (Geary & Lucky, 1999). Tinea pedis may present with various clinical patterns. The major clinical forms are: interdigital dyshidrosis ('athlete's foot') and the moccasin-type. Moccasin-type tinea pedis infections are erythematous and squamous lesions extending to the entire plantar surface of the foot, which is extensively involved. Itching may be also present and intense.

Tinea unguium, sometimes consequential to tinea pedis, is characterized by onycholysis and thickened, discoloured (white, yellow, brown, black), brittle and dystrophic nails. Although inflammation is uncommon, some patients may, however, experience pain. The most common aetiological agents of tinea pedis, isolated in adults, are *T. rubrum* and *Trichophyton mentagrophytes* var. *interdigitale*. In our case report, *T. rubrum* was isolated in a child affected by both tinea pedis and tinea unguium, thus demonstrating that ungual infection could be a consequence of tinea pedis, and confirming the data in the literature (Ploysangam & Lucky, 1997). No external contagious source was found; therefore, tinea pedis infection in the child could be associated with the father's fungal infection, suggesting a family background and confirming what has been observed by other authors (Chang & Logemann, 1994; Jang *et al.*, 2000).

In conclusion, we reported this case for its peculiar and exceptional findings, and its association with tinea pedis and tinea unguium in a 7-year-old boy. Therefore, we suggest that mycological detection is mandatory to distinguish between a foot dermatosis and tinea pedis in children, in order to provide the most appropriate treatment. Hence, making the right diagnosis is the key to obtaining epidemiological data as regards the exact prevalence of tinea pedis and tinea unguium in children, and evaluating if they are underestimated, rare or increasing.

Acknowledgements

The authors thank Professor M. G. Teriaca (Rosmini Institute, University of Turin) for a helpful English review of this manuscript.

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