



## Tinea capitis caused by *Trichophyton tonsurans*: An emerging disease in Argentina

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### ABSTRACT

Tinea capitis is a dermatophytosis, which is more common in children. It is caused by dermatophytes that vary according to the region; the most frequently isolated dermatophyte in our setting is *Microsporum canis*. Given its anthropophilic nature, its dissemination via interpersonal transmission and through the use of hair care tools is very common.

In the course of the past year, an increase has been reported in the incidence of a pathogen that was very rare in our setting: *Trichophyton tonsurans*. Here we describe a retrospective study of cases of tinea capitis caused by *Trichophyton tonsurans* identified between September 2021 and March 2023 in the Department of Pediatric Dermatology at a general hospital of the City of Buenos Aires.

**Keywords:** tinea capitis; *Trichophyton tonsurans*; barber shop.

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## INTRODUCTION

Tinea capitis is a fungal infection of the scalp that mainly affects children and adolescents worldwide.<sup>1</sup> The fungus *Trichophyton tonsurans* has become an emerging causative agent in Argentina in recent years.<sup>2,3</sup> Such emergence is consistent with the increase in the number of barbershops and fashion haircuts using hair clippers in children and adolescents. It is well documented that ringworm may be disseminated through contact with contaminated objects, such as barber combs, brushes,<sup>4,5</sup> clippers, or scissors.<sup>6,7</sup> This is particularly relevant in the case of *Trichophyton tonsurans*, as an epidemiological relationship has been evidenced between the presence of *Trichophyton tonsurans* in barbershops and the prevalence of tinea capitis in the population.<sup>6,8</sup>

The objective of this study was to describe the characteristics of pediatric patients with tinea capitis caused by *Trichophyton tonsurans* who consulted with the Department of Pediatric Dermatology of Hospital Ramos Mejía, in the City of Buenos Aires, between September 2021 and March 2023.

## POPULATION AND METHODS

This was a retrospective, descriptive, and observational study conducted between September 2021 and March 2023 in the Department of Pediatric Dermatology of Hospital Ramos Mejía in the City of Buenos Aires. The study included patients younger than 18 years who had tinea capitis or kerion caused by *Trichophyton tonsurans*. Patients with tinea capitis due to a different causative agent were excluded.

Diagnosis was based on clinical signs, and was confirmed with the results provided by the Department of Microbiology of Hospital Ramos Mejía. Samples were collected by scraping the lesion with a broad-bladed scalpel to obtain scales and depilation to obtain hairs. Subsequently, the samples were observed by direct examination using potassium hydroxide (KOH) 40% solution and Parker® permanent blue/black ink to detect fungal elements; the culture was performed using Sabouraud dextrose agar with chloramphenicol and selective and differential agar for dermatophyte growth (DTM), composed of Mycosel agar supplemented with phenol red solution 5%. Cultures were incubated at 28 °C for 21 days.

Study variables were age, sex, clinical characteristics, history of attendance to a barbershop, contact with animals or people with

tinea, administered treatments, and disease course.

The protocol was approved by the Research Ethics Committee of Hospital Ramos Mejía, in the City of Buenos Aires (registry no. 10761, dated 10/4/2023). Patients and their parents and legal tutors were asked to give their informed consent.

## RESULTS

During the study period, 92 patients diagnosed with tinea capitis were seen at the Department. Of these, 8 were excluded due to negative cultures; 2 due to environmental fungal contamination; 23, due to positive culture for *Microsporum*; and 30 were lost to follow-up. A total of 29 child and adolescent patients were included who were diagnosed with tinea capitis due to *Trichophyton tonsurans* (Figure 1).

The 29 patients included corresponded to 23 boys and 6 girls. Their median age was 7.9 years (range: 3 to 14 years).

The clinical forms observed included pseudo-alopecic plaques on the scalp with fine grayish flaking on the surface, without a specific localization. Figures 2 and 3 show the variable localization, both in the occipital and frontal regions. The typical haircut using clippers is observed. Kerion, the inflammatory form of presentation, was observed in 3 patients.

In relation to their history, 28/29 patients had a history of having a haircut with a clipper at a barbershop, while 2 patients had contact with a sibling who attended a barbershop.

Treatment included terbinafine 3–5 mg/kg/day in 13/29 patients and griseofulvin 20–25 mg/kg/day in 12/29 patients. The 3 patients with kerion were also indicated meprednisone 1 mg/kg/day for 10 days. Regarding the 4 remaining patients, 2 did not return to the clinic, 1 received treatment with both antifungal medications, and 1 used antifungal shampoo. The condition resolved in most patients in less than 1 month.

## DISCUSSION

The incidence of tinea capitis caused by *Trichophyton tonsurans* in the City of Buenos Aires has increased in recent years.<sup>2,3</sup> Sometimes, given its clinical characteristics, it may be confused with *alopecia areata*, erythematous plaques of scalp psoriasis, or eczema plaques. Therefore, it is critical to perform a fungal test to identify the microorganism. Table 1 details the clinical, histopathological, and treatment differences with classical tinea caused by

FIGURE 1. Flow chart of patient inclusion

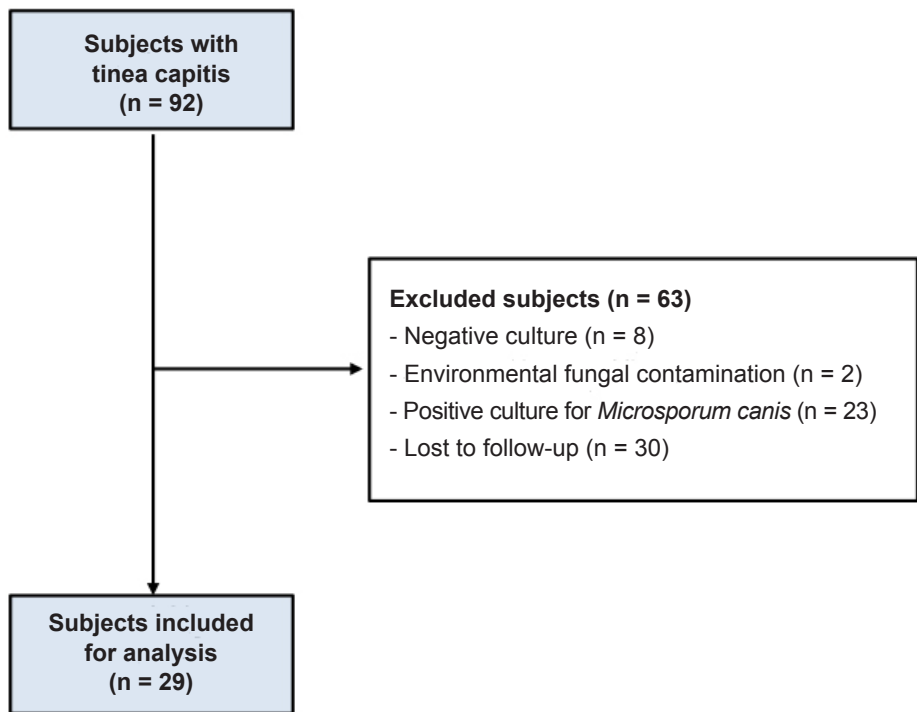


FIGURE 2. Flaking plaques in frontal region



*Microsporum canis*.

A prospective, descriptive, and observational study conducted at Hospital Garrahan de Buenos Aires in the 2004–2006 period assessed 178 children with tinea capitis or kerion. It found *Trichophyton tonsurans* in 14/111 patients (12.61%).<sup>3</sup> In our study, the clinical presentation

(prevalence of non-inflammatory tinea over kerion), age, and sex were consistent with the study conducted at Hospital Garrahan mentioned above.

The treatment of choice for tinea caused by *Trichophyton tonsurans* is terbinafine at 3–5 mg/kg/day until no active lesions are observed. On the

FIGURE 3. Alopecic plaque with mild flaking, satellite plaques predominantly in the occipital region



TABLE 1. Difference from tinea caused by *Microsporum canis*

<i>Trichophyton tonsurans</i>	<i>Microsporum canis</i>
Multiples plaques	Single or multiples plaques
Spread internally	Spread externally
Whitish scales	Fine grayish scales
Hair cut at different levels for dermatoscopy	Hair cut at the same level for dermatoscopy
Treatment with terbinafine	Treatment with griseofulvin

contrary, the treatment of choice for tinea caused by *Microsporum canis* is griseofulvin at 20–25 mg/kg/day. In routine practice, no laboratory test is done before or during medication use.

In our experience, as in other reported studies, children who get haircuts at barbershops have a higher risk for tinea capitis caused by *Trichophyton tonsurans* compared to those who do not.<sup>6,8</sup> This is because hair care tools, such as razors and scissors, may spread the fungus from infected to healthy children.<sup>7</sup>

Implementing adequate hygiene and disinfection measures at barbershops allows to reduce the dissemination of tinea capitis and other scalp infections.<sup>5</sup> In this regard, it is important to

disassemble hair clippers to clean them properly with alcohol and remove the hyphae from haircut instruments. They should ideally be sterilized.

It is critical that parents and caregivers are informed about preventive measures (we suggest each client uses their own or family hair clippers) and about the symptoms of tinea capitis to detect and treat it in a timely manner.

### CONCLUSION

Tinea capitis caused by *Trichophyton tonsurans* is a public health problem in the pediatric population of Argentina. There is an epidemiological relationship between the presence of *Trichophyton tonsurans* in

barbershops and the prevalence of infection in the population. A joint effort from the health authorities, parents, and barbershop staff is required to implement adequate preventive and control measures and to reduce the incidence of tinea capitis in the population. ■

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