

Tinea Capitis Caused by Trichophyton Rubrum

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We present a case of tinea capitis in a four-week-old infant caused by Trichophyton rubrum; the patient was effectively treated with griseofulvin ultramicrosized. Although tinea capitis is the most common fungal infection in children, it is rarely seen in immunocompetent infants. Tinea capitis involves infection of both the hair shaft and pilosebaceous unit, thus mandating treatment with systemic antifungal therapy.

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Tinea capitis is a dermatophyte fungal infection superficially affecting the scalp in which hyphae or arthrospores deposited on the epidermis attacking hair follicles and/or shafts. Tinea capitis is rare in infancy; it is even rarer in neonates, two species of the genera *Microsporum* and *Trichophyton* are involved^{1,2,3}. It affects mainly school-aged children^{3,5-6}. In North America and United Kingdom, the main pathogens for tinea capitis remain *Trichophyton tonsurans*^{5,7}. *Trichophyton rubrum* is seldom reported to cause tinea capitis; rather, it is the main pathogenic organism in tinea corporis, pedis, and unguium^{4,6,8-11}. *Microsporum* species and *Trichophyton rubrum* do not fluoresce under a wood's lamp.

Shaving scalp, applying hair oil are practices that might increase the risk of disease transmission and this type of infection is frequently spread among family members. Nevertheless, in the non-urban communities, the disease is usually caused by *Microsporum canis* through kittens and puppies and accounts for approximately 10% in the U.K.

In the urban areas, the diagnosis of tinea capitis should be considered in children older than 3 months with scaly scalp. It is usually divided into inflammatory and non-inflammatory which are commonly presented with patchy alopecia³.

Four major clinical subtypes of tinea capitis are recognized: (1) inflammatory (e.g. Kerion), (2) non-inflammatory, often referred to as "gray patch", (3) black dot, and (4) favus, the uncommon

chronic form. The two recognized pathological forms are endothrix and ectothrix. Endothrix grows within the hair shaft and the cuticle is spared destruction, whereas ectothrix grows outside the hair shaft or just beneath the cuticle eventually leading to cuticle destruction.

The inflammatory type could cause painful localized lymphadenopathy. An “id” reaction which occurs around the outer helix of the ear characterized by generalized eruption of itchy papules could be mistaken as drug eruption³.

The aim of this report is to present a four-week-old infant with tinea capitis caused by *Trichophyton rubrum*.

THE CASE

A healthy 4-week-old Hispanic male baby presented with a single annular erythematous plaque on the right side of the scalp along the frontal hair line for one week. The patient was delivered at full-term through normal spontaneous delivery and weighed 3.8 kg; no history of illness since birth. The lesion exhibited an active papular-pustular margin with central clearing, see figure 1. The rest of the scalp examination was within normal. Hair-pull examination did not reveal easy pluckability. Family history for scalp ringworm was positive; the patient’s aunt had active tinea capitis that was treated with oral terbinafine. No other family members were affected. The patient had been in close physical contact with the infected aunt; therefore, transmission through direct contact was thought to be the mechanism of inoculation. The lesion did not fluoresce under wood’s light examination; however, skin scrapings from the active papular-pustular margins revealed branching septate hyphae upon direct microscopic examination using 20% potassium-hydroxide solution. Culture was performed using Sabouraud’s dextrose agar, which was positive for *Trichophyton rubrum*. The infant was treated with griseofulvin ultramicrosize syrup 5 mg/kg twice daily. The lesion disappeared within four weeks. The patient did not experience any side effects from the treatment.



Figure 1: Single Annular Erythematous Plaque on the Right Side of the Scalp with Active Papular-Pustular Margin and Central Clearing

DISCUSSION

Tinea capitis caused by *Trichophyton rubrum* occurs in less than 1 percent of all cases^{8,9}. In the English literature, there were two reported cases of tinea capitis in newborns caused by *Trichophyton Rubrum*^{10,12}.

The incubation period for tinea capitis is short¹⁰. A survey of the literature reveals infections occurring in 2, 5, 6, 8, and 21-day-old neonates¹³⁻¹⁷. Children with tinea capitis tend to have a family member who is an asymptomatic carrier^{1,4,18}. In our case, however, the causative mechanism appears to be direct inoculation by an infected family member.

A specimen of affected hair, scalp scales and even the broken-off hair stubs should be taken to laboratory looking for mycology spores and hyphae. Sometimes, Wood's light examination would be helpful in cases infected by *Microsporum canis*, *Microsporum rivalieri* and *Microsporum audouinii* would fluoresce bright green³.

Treatment is recommended using oral antifungal medication. Topical treatment is usually ineffective. However, in early stages of systemic treatments, it is recommended to use topical treatment as it reduced the chance of transmission. To reduce the infectivity, Selenium sulphide 11 and povidone iodine 12 shampoos are used twice weekly. In some cases, the use of oral and topical corticosteroids may be helpful to decrease itching and discomfort³. In children, the treatment remains Griseofulvin. Six to twelve weeks of systemic therapy is required to optimize results.

Other options in treating tinea capitis in children include itraconazole, terbinafine, and fluconazole. Oral Lamisil is not approved for infants weighing less than 10 kg, and fluconazole does not have established dose parameters for those below 6 months of age¹⁹. Gupta et al recommended that Endothrix infection caused by *Tinea tonsurans* could be treated with oral itraconazole solution using either a pulse regimen (3 mg/kg/day for 1 week plus 1-3 pulses 3 weeks apart) or a daily regimen (5 mg/kg/day for 4 weeks)²⁰. Terbinafine, which is not available in a liquid form, could be used daily for 2-4 weeks, in ≤ 20 kg body weight 62.5 mg PO QD, 20-40 kg: 25 mg PO QD, and in >40 kg: 250 PO QD. Fluconazole could be used daily for 20 days at 6 mg/kg/day. Ectothrix organisms like *Microsporum canis* may mandate longer treatment duration²⁰.

It is advised to decrease direct contact with family members, exclusion from school until appropriate systemic and adjuvant topical therapy is started and disposal of hairbrushes and combs.

Treatment usually fails due to lack of compliance, resistant organism, insensitivity and reinfection. If there is clinical improvement with positive isolation, an extra month of oral antifungal is recommended. If there were no clinical improvement, the management would be either increasing the dose or duration of the drug used or changing the antifungal agent.

Even with clinical improvement, monthly follow-up should be continued until mycological sampling is negative³.

CONCLUSION

A four-week-old infant presented with tinea capitis caused by *Trichophyton rubrum*; the patient was effectively treated with griseofulvin ultramicrosize.

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