

Topical Treatment of Tinea Capitis in a Neonate

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*Tinea capitis is the most common fungal skin infection in children. Given that this infection invades the hair shaft and the pilosebaceous unit, systemic antifungal therapy is the gold standard of treatment. Despite the neonate's increased susceptibility to infections, tinea capitis is rare in this population. We present the case of a 16-day-old infant with tinea capitis caused by *Microsporum canis* and effectively treated with topical bifonazole 1%.*

Tinea capitis is a fungal infection of the scalp. This infection, which involves the hair shaft and the pilosebaceous unit, is the most common cutaneous mycosis in children. Despite the neonate's increased susceptibility to infections, including fungal infections, tinea capitis is rare in this population.¹⁻⁶ The fungi may be anthropophilic (spread from humans), zoophilic (spread from animals), or geophilic (spread from soil). In the past, *Microsporum canis* was the leading cause of the infection, but most of the current US cases are caused by *Trichophyton tonsurans*.¹ In the Middle East and in parts of Europe, *M canis* is still the most common pathogen causing tinea capitis.^{7,8}

Systemic antifungal medication containing griseofulvin is considered the treatment of choice for tinea capitis, but other oral antifungal agents have been recently introduced.⁹ We report the case of a neonate with tinea capitis successfully treated with a topical antifungal agent, and we propose this modality of therapy for this age group.

Case Report

A 16-day-old boy with fever was admitted to our Department of Pediatrics. Prenatal course and

delivery had been uneventful, and birth weight had been 3340 g. The boy's healthy white parents, who lived in a rural area, provided shelter for street cats. Approximately 50 cats lived in the family's garden, and 2 cats lived in the home. The family had no dogs or other animals.

On admission, the baby appeared to have had good nutrition, and there were no signs of acute distress. His temperature was 39.7°C; heart rate, 132 beats per minute; blood pressure, 80/45 mm Hg; and blood oxygen saturation, 98%. The findings from the rest of the physical examination were normal except for 7 round skin lesions (on the forehead, eyelids, and scalp). Noted by the parents 4 days earlier, these lesions were annular and erythematous and had scaly plaques (0.5–3.5 cm in diameter) with central clearing and distinct borders (Figure).

The sepsis workup for the fever included blood, urine, and cerebrospinal cultures. The blood and urine cultures yielded *Escherichia coli*. Treatment with antibiotics gentamicin and ampicillin was initiated; given the susceptibility of the *E coli*, these antibiotics were changed to cefuroxime (100 mg/kg per day) after 48 hours. The baby was treated for 10 days. Within the first 2 days, his fever disappeared, and his urine was sterilized. The skin lesions were diagnosed as tinea capitis and tinea corporis.

A swab taken of the infected skin was examined under the microscope. Spores and hyphae were abundant, and *M canis* grew in the culture. Bifonazole 1% cream (Agispor; Agis Ltd., Bnei-Brak, Israel) was applied to the infected skin twice daily for 8 weeks. The lesions on the forehead and eyelids resolved within 2 weeks of treatment, and those on the scalp and hair follicles resolved gradually and fully within 2 months. Alopecia, which developed in the infected areas during the course of the tinea capitis, resolved completely. Signs of fungal infection were not found in other members of the family. At follow-up at the age of 6 months, the child was healthy, and signs of recurrence were not found.

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Figure not available online

Lesions on the face
and forehead.

Comment

Our patient's *M canis* infection was probably zoophilic—related to the cats the family kept at home. Tinea capitis usually involves the skin, hair shaft, and pilosebaceous unit. Involvement of the hair is important, as several topical antifungal medications (eg, azoles) do not affect the fungi in the hair sheaths.¹⁰ Trials of topical treatment of tinea capitis in humans and animals are frequently ineffective.¹⁰ Therefore, systemic treatment, which may affect the fungi in the hair sheaths and prevent them from invading the inner hair structure, is recommended. For the past 40 years, griseofulvin has been the main systemic antifungal medication used for this indication. Newer antifungal agents—terbinafine, itraconazole, and fluconazole—also are used and seem effective and safe for treatment of tinea capitis.⁹ Although side effects are usually mild and transient, occasionally serious side effects (eg, angioedema, erythema multiforme, exfoliative dermatitis, blood dyscrasias, proteinuria, hepatotoxicity, Kawasaki-like syndrome) have been reported.^{11,12} Because the pharmacokinetics and safety of these medications have not been completely investigated in young children and neonates,

these medications are usually not recommended for neonates, unless severe or life-threatening conditions exist.

Some cases of tinea capitis in newborns were treated with topical agents with good or partial response.^{1,6} In our case, topical treatment with bifonazole 1% was effective and well tolerated. The effectiveness of topical treatment in neonates can be explained by increased absorption of the medication through their skin compared with the skin of older individuals. Snider et al¹ proposed that therapy has little or no real effect on tinea capitis in the neonate and that the infant's case clears up with spontaneous hair loss (telogen effluvium). In our patient, localized alopecia developed near the fungal infection, and then normal hair grew in the same area without telogen effluvium. These events favor the first explanation—that the therapeutic effect of topical medication is greater in neonates than in adults, perhaps because of the increased permeability of neonatal skin compared with adult skin.

Considering our case and other reported cases, we propose that topical medication may be an effective treatment for tinea capitis in neonates

and that topical medication is probably safer than systemic medication. Further studies are needed to confirm this proposal and to determine the recommended approach.

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