



Family-Wide Infection with *Microsporium canis* Following Exposure to a Domestic Cat

Anne Stockmann¹, Lisbeth Lützen², Karen M. T. Astvad³, Kristin Bergmann⁴, Sebastian V. Svendsen^{1,5}, Mathias T. Svendsen^{1,5}

¹The Department of Dermatology and Allergy, Odense University Hospital, Denmark

²Department of Clinical Microbiology, Vejle Hospital, Denmark

³Bacteria, Parasites & Fungi, Statens Serum Institute, Copenhagen, Denmark

⁴The Department of Dermatology and Venereology, Aarhus University Hospital, Denmark

⁵Department of Clinical Research, University of Southern Denmark, Denmark

Article Info

Article Notes

Received: July 01, 2025

Accepted: September 05, 2025

*Correspondence:

*Dr. Anne Stockmann, The Department of Dermatology and Allergy, Odense University Hospital, Denmark;
Email: Anne.stockmann@rsyd.dk.

©2025 Stockmann A. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License.

Keywords:

Dermatophyte infection
Griseofulvin
Ketoconazole
Microsporium canis
Tinea capitis
Tinea corporis
Zoonotic dermatophyte

Abstract

Tinea capitis is a superficial dermatophyte infection affecting the hair and scalp. The zoophilic dermatophyte *Microsporium canis* is one of the most frequent causes of both tinea capitis and tinea corporis in humans, particularly in children.

We present a case report involving whole-family transmission of *M. canis* due to close contact with a neighbor's cat. All five children in the household developed scaly scalp lesions consistent with tinea capitis, while the parents exhibited only mild cutaneous involvement. Skin scrapings and hair samples from all family members were collected and analyzed using PCR, confirming *M. canis* in all family members.

The children were successfully treated with oral griseofulvin, while the parents responded well to topical ketoconazole shampoo.

This case highlights the importance of clinical awareness of tinea capitis, as early diagnosis and treatment are essential to prevent chronic hair changes and limit further transmission. Additionally, treatment of the infected animal under veterinary supervision is crucial to avoid reinfection.

Introduction

Tinea capitis is a superficial dermatophyte infection of the hair and scalp. It is caused by antropophilic, zoophilic, or geophilic dermatophytes^{1,5}. Among the zoophilic species, *Microsporium canis* is one of the most common causes of both tinea capitis and tinea corporis in humans, particularly in children². *M. canis* primarily infects cats and dogs, and transmission to humans occurs through direct contact with infected animals, contaminated fomites, or in some cases person-to-person spread¹⁻⁴.

Globally, *M. canis* remains the leading cause of tinea capitis in children. However, the predominant causative agents shift over time due to various factors, including economic development, climate change, immigration, and evolving lifestyles. These shifts are influenced by changes in human-animal interactions, the prevalence of stray animals, and pet-ownership patterns^{1,5,6}.

Case Presentation

A family of seven, including five children aged 2 to 13 years, was referred to the dermatology department with scaly skin lesions affecting the body and scalp. Clinical examination revealed a 9-year-



Figure 1: Tinea capitis in 9-year-old boy, presenting a well-demarcated round alopecic patch in the scalp, with fine white-grayish scale and broken hairs exhibiting a classic stubby appearance.

old boy with a 4x4 cm patch on the scalp, characterized by fine scaling, mild erythema, and broken hairs (Figure 1). His siblings exhibited similar scalp lesions, while the parents presented with only discrete scaly lesions on the body.

Prior to the infection the children had been in close contact with the neighbor's cat exhibiting areas of hair loss. Suspecting a dermatophyte infection, all the family members underwent examination with a Wood's lamp, which revealed the characteristic yellow-green fluorescence indicative of *M. canis*. Trichoscopy of individuals with scalp lesions showed comma hairs and diffuse scaling. Skin scrapings and hair samples were collected for PCR analysis at the regional department of Clinical Microbiology. In-house real-time PCR was performed (by the method and with primers and probes as described by Wisselink et al.)⁷. Samples from all family members were positive for *M. canis/M. audouinii* (as the PCR does not distinguish between the two species).

The children were treated systemically with oral griseofulvin (microsize formulation) at a dosage of 20 mg/kg/day, administered in two divided doses daily for 12 weeks. The parents, who exhibited only mild cutaneous lesions, were treated with 2% ketoconazole shampoo applied twice weekly. In addition, the family received guidance on appropriate hygiene measures, and a thorough disinfection of the home environment was carried out to prevent further transmission. Treatments resulted in complete hair regrowth and negative follow-up fungal cultures in all affected individuals.

One year later, two of the children were re-referred to

the dermatology department after developing new scaly lesions on the scalp. They had remained in close contact with the cat, which had not received treatment. Skin scrapings and hair samples once again tested PCR positive for *M. canis/audouinii*. This time, additional samples were submitted to the Unit of Mycology at Statens Serum Institute, where culture and sequencing of the isolates identified *M. canis* in both children.

The children were successfully treated with oral griseofulvin for an additional 12 weeks. Subsequently, a favorable clinical response was observed, with hair regrowth and negative follow-up cultures.

The neighbor's cat was subsequently examined by a veterinarian, and *M. canis* was also detected via PCR analysis.

Discussion

This case report illustrates intra-familial transmission of *M. canis* originating from a neighbor's cat. Zoonotic transmission of *M. canis*, particularly from felines, remains a clinically significant cause of tinea infections in children and adults. However, tinea capitis is rarely observed in adults, likely due to decreased sebum production with age, which may offer some protective effect. This is reflected in this case report, where only the children developed scalp involvement, while the parents exhibited mild cutaneous lesions. The case underscores the importance of considering animal-to-human transmission in instances of recurrent or familial dermatophytosis.

Tinea capitis is highly contagious and can significantly impact a patient's quality of life due to its chronic nature, visible symptoms, and associated pruritic alopecia. If left untreated, it may lead to secondary bacterial infections, permanent hair loss, alterations in hair structure, and persistent itching. Given its high transmissibility, tinea capitis can cause outbreaks in schools and local communities. These clinical and social consequences may contribute to stigma, reduced self-esteem, and diminished quality of life, particularly in children⁶.

Treatment of tinea capitis aims to relieve symptoms, prevent chronic hair changes and transmission. As such, a combination of systemic and topical therapy, along with strict hygienic measures, is essential. In Denmark, the first-line treatment for tinea capitis caused by *Microsporium* species is oral griseofulvin, supported by adjunctive topical treatment with 2% ketoconazole shampoo or crème. Treatment is continued until clinical and mycological healing are achieved⁸.

Hygienic measures within the household are essential and include regular cleaning and disinfection of surfaces, personal items (eg. combs and brushes) and textiles; avoiding sharing personal items, and maintaining high

standards of personal hygiene - especially after contact with infected persons and contaminated objects⁶. Despite the high transmissibility of *M. canis*, it is notable that all seven family members, including the adults, became infected. As the parents reportedly had no contact with the infected cat, the widespread intra-family transmission is most likely attributable to the family's crowded living conditions in a confined household setting. These circumstances may have hindered the implementation of effective hygiene measures and limited the ability to avoid contact with infected individuals and contaminated items.

Tinea capitis remains a significant global health concern, particularly among children. Prevalence rates vary widely across regions, with reported rates reaching up to 88% in parts of Africa, 74% in America, 91% in Asia, 69% in Europe, and 86% in Oceania. *M. canis* continues to be the most prevalent causative pathogen worldwide, although regional variations exist and shifts in dominant species have been observed over time due to factors such as migration, lifestyle changes, and animal contact patterns⁵.

Given its widespread impact, it is essential that clinicians remain vigilant in recognizing the clinical features of tinea capitis to ensure timely diagnosis, appropriate treatment, and the implementation of hygiene measures. Additionally, identifying and managing the zoophilic source of infection is crucial to prevent reinfection. Clinicians should consider all potential animal contacts – not just household pets – as a potential source of transmission.

Conclusion

Prompt diagnosis and treatment of dermatophyte infections are essential to minimize the risk of permanent hair loss, ensure effective eradication, reduce transmission, and mitigate the impact on patients' quality of life. Identifying a potential zoophilic source of infection is also crucial, and any implicated animals should be treated under veterinary supervision to prevent reinfection.

Patient Consent Statement

The authors obtained written consent from patients for their photographs and medical information to be published

in print and online and with the understanding that the information will be publicly available.

Acknowledgements

None

Conflict of Interest

Anne Stockmann, Lisbeth Lützen, Kristin Bergmann, Sebastian V. Svendsen and Mathias T. Svendsen have no conflicts of interest. Karen M. T. Astvad discloses personal fees from Gilead Sciences.

Funding Information

The authors received no financial support for the research, authorship or publication of this article.

References

1. Chen XQ, Yu J. Global Demographic Characteristics and Pathogen Spectrum of Tinea Capitis. *Mycopathologia*. 2023 Oct; 188(5): 433-447.
2. Keshwania P, Kaur N, Chauhan J, et. al. Superficial Dermatophytosis across the World's Populations: Potential Benefits from Nanocarrier-Based Therapies and Rising Challenges. *ACS Omega*. 2023 Aug 22; 8(35): 31575-31599.
3. Brosh-Nissimov T, Ben-Ami R, Astman N, et. al. An Outbreak of *Microsporium canis* infection at a military base associated with stray cat exposure and person-to-person transmission. *Mycoses*. 2018 Jul; 61(7): 472-476.
4. Moskaluk AE, VandeWoude S. Current Topics in Dermatophyte Classification and Clinical Diagnosis. *Pathogens*. 2022 Aug 23; 11(9): 957.
5. Rodríguez-Cerdeira C, Martínez-Herrera E, Szepietowski JC, et. Al. A systematic review of worldwide data on tinea capitis: analysis of the last 20 years. *J Eur Acad Dermatol Venereol*. 2021 Apr; 35(4): 844-883.
6. Gupta AK, Polla Ravi S, Wang T, et al. An update on tinea capitis in children. *Pediatr Dermatol*. 2024 Nov-Dec; 41(6): 1030-1039.
7. Wisselink GJ, van Zanten E, Kooistra-Smid AMD. Trapped in keratin; a comparison of dermatophyte detection in nail, skin and hair samples directly from clinical samples using culture and real-time PCR. *J Microbiol Methods* 2011; 85: 62-66.
8. Andersen PL, Lund Andersen SM, Astvad KMT, et. al. Kliniske guidelines for superficielle svampeinfektioner. Dansk Dermatologisk Selskab; 3rd edition, november 2024. Available from: <https://dds.nu/wp-content/uploads/2025/06/DDS-Guidelines-for-sup.-svampeinfektioner-2025.pdf> (last visited 18th of July 2025).