

Treatment of Dermatophytoses Caused by *Microsporium canis* in *Alouatta guariba* Primates

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ABSTRACT

Background: Dermatophytoses are cosmopolitan contagious mycoses of the skin and concern a wide range of mammals, including man, and more rarely birds. These mycoses are rarely diagnosed in New World Primates. The most frequent tinea of the subhuman Primates is microsporiasis due to *Microsporium canis* or trichophytosis by *Trichophyton mentagrophytes* and *T. simii*. The main clinical features are regular alopecia with erythema and squamosis, usually non-pruriginous although various degree of inflammation may modify this typical aspect. As a consequence, an accurate clinical examination, a good differential diagnosis and laboratory analyses are required for a correct identification. *Alouatta guariba* are primates found from the Amazon region up to the Argentina Northwest. Due to the population development and expansion of the urban perimeters these animals are losing their space in their own natural habitat and being exposed to more closed relationship with domestic animals and humans. This report contains five cases of dermatophytoses caused by *Microsporium canis* in *Alouatta* sp., which were treated in a private clinic in Porto Alegre, RS, Brazil.

Case: Five females of *Alouatta guariba* with aged between 2 and 8 months old were admitted in a private veterinary clinic (Toca dos Bichos, Porto Alegre). Each of them had different injuries (electric chock, death of the parent due gun shot, aggression between families and dog bite) and were admitted in different dates. All five primates were presented with intense pruritus after 7 or 10 days of admission. At physical examination lesions characteristic of dermatophytoses were found. To establish a definitive diagnosis it was collected fur and skin and the material was send to the Mycology Laboratory of the Faculdade de Veterinária, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil. The fungic culture was positive for *Microsporium canis*. The treatment established was fluconazole, 18 mg/kg/day PO, mixed in smashed bananas. After two weeks of treatment, a sensitive clinic improvement was seen in all primates, characterized by diminishing of pruritus and alopecic areas. At 30 days of treatment the animals had no clinical signs of lesions and had their fur completely re-grown. The medication was administered for more 15 days, totalizing 45 days of treatment, at which time the animals were considered cured. The primates were monitored for more 30 days after the last dose of fluconazole.

Discussion: Case reports on the isolation of *Microsporium canis* in non-human primates, mainly in New World Primates, are very rare in the Brazilian literature. It is necessary more cohesive approach to nonhuman primate (NHP) dermatology, without relying on assumptions that it is similar to other veterinary disease. Mycological culture remains the gold standard for the diagnosis of animal dermatophytosis and the only method for the phenotypic identification of dermatophyte species. The fluconazole treatment proved to be highly effective, as the animals were all cured and there was no side effects related. This case report proves the importance of a correct mycological diagnostic in free-range animals as an effective treatment in *Alouatta guariba*.

Keywords: *Alouatta guariba*, *Microsporium canis*, fluconazole, dermatophytoses, primates.

INTRODUCTION

Dermatophytoses, also called ringworm or tinea, are cosmopolitan contagious mycoses of the skin caused by dermatophytes and concern a wide range of mammals, including man, and more rarely birds. Contagiousness among animal communities, high cost of treatment, difficulty of control measures, and the public health consequences of animal ringworm explain their great importance [4,13].

A wide variety of dermatophytes have been isolated from animals, but the most common are *Microsporium canis* and *Trichophyton mentagrophytes* [2,3]. In captive settings, infections are usually associated with contact with humans or domestic pets.

The dermatophytoses are rarely diagnosed in New World Primates. [7,8,17]. The most frequent tinea of the subhuman Primates is microsporosis due to *Microsporium canis* or trichophytosis by *Trichophyton mentagrophytes* and *T. simii*. [14]. The literature register cases of *Microsporium* sp. in Rhesus monkeys due to the proximity to dogs and cats environments [1]. There was also a case of a dermatophytoses outbreak caused by *Microsporium canis* in gibbon monkey, caused by human contamination [15].

The *Alouatta guariba* are primates found from the Amazon region up to the Argentina Norwest. Due to the population development and expansion of the urban perimeters this animals are losing their space in their own natural habitat and being exposed to more closed relationship with domestic animals and humans.

This report contains five cases of dermatophytoses caused by *Microsporium canis* in *Alouatta guariba*, which were treated in a private clinic in Porto Alegre, RS, Brazil.

CASE REPORT

Five females of *Alouatta guariba*, with ages between 2 and 8 months old were admitted in a private veterinary clinic (Toca dos Bichos, Porto Alegre, Brazil). Each one of them had different injuries (electric chock, death of the parents due to gun shot, aggression between families and dog bite) and were admitted in different dates. Three primates (group 1) were admitted and treated their injuries 18 months before the admission of the last 2 animals (group 2). It's important to point out that there was no relationship between the groups. The females of each

group were adapted to live together and had no relationship or social problems when put at the same cage. All five animals (groups 1 and 2) shown intense pruritus after 7 or 10 days of admission. At physical examination lesions characteristic of dermatophytoses were found (Figure 1). To establish a definitive diagnosis it was collected fur and skin and the material was send to the Mycology Laboratory of the Faculdade de Veterinária, Universidade Federal do Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil. The fungal culture was positive for *Microsporium canis*. The treatment established was fluconazole, 18 mg/kg/day PO [6,8,19], mixed in smashed bananas, for 45 days. After two weeks of treatment, a sensitive clinical improvement was seen in all primates, characterized by diminishing of pruritus and alopecic areas. At 30 days of treatment the animals had no clinical signs of lesions and had their fur completely re-grown (Figure 2). The medication was administered for more 15 days, completing 45 days of treatment, at his time the animals were considered cured. The animals were monitored for more 30 days after the last dose of fluconazole.

DISCUSSION

Many species of dermatophytes have been isolated from domestic, captive and free-living animals, but some of them are more often associated with a particular host [3,5,9,10,12,14-16,18]. Most studies indicated that *Microsporium canis* is the most prevalent dermatophyte isolated from animals, but reports about dermatophytoses in wild animals are poorly described and characterized [2,9,10]. *Microsporium* sp. was not isolated in a study made in 226 primates, instead it was only isolated *Trichophyton* sp. (14). Dermatophytoses has been reported in non-human primates secondary to infection with *Microsporium* and *Trichophyton* species [17].

The transmission of ringworm occurs through direct contact with infected animals or indirectly from contaminated fomites. It explains a higher occurrence of ringworm in animals which are coned in catteries, kennels, stables, cowshed or intensive breeding units [3,6,13]. In addition, the high resistance of the dermatophyte conidia for months or years in the environment explains why the use of material that is shared between animals for grooming, harnessing or



Figure 1. Alopecia (arrow) in the eyebrow of an *Alouatta guariba* caused by *Microsporum canis*.



Figure 2. The complete hair growth restoration was achieved after treatment with fluconazol for 45 days in *Alouatta guariba*.

transportation favors the contamination. Also, it is isolated from asymptomatic animals that act as carriers, more often in cats [3,4,13].

Most of the times, the loss of the natural microhabitat, which occurs around the urban centers, enhances the animals stress levels, lowering their immunity and causing the appearance of many different diseases, among them mycoses [6]. Besides that, it is possible for the animal to incubate these pathogens and develop them in favorable conditions, as the stress in captivity [11].

The lesions may be localized, generalized or multifocal [17]. The main clinical features are regular alopecia with erythema and squamosis, usually non-pruriginous although various degree of inflammation may modify this typical aspect. As a consequence, an accurate clinical examination, a good differential diagnosis and laboratory analyses are required for a correct identification [3].

Mycological culture remains the gold standard for the diagnosis of animal dermatophytosis and the only method for the phenotypic identification of dermatophyte species. Depending on the localization and aspect of lesions, various samples obtained from hairs, scales, crusts, claws and tissue biopsies can be seeded onto culture media [3].

Veterinary dermatologists in general do not have extensive experience with nonhuman primate (NHP) dermatoses. With exceptions, the literature does not provide an organized evidence-based approach to the NHP dermatological case [2]. History of animal life, way and date of acquisition, contact with other animals, and the possible appearance of skin lesions on the owners are also indicative for diagnosis [3-5].

Lesions caused by dermatophytes have been described in primates of the genus *Ateles* and are characterized by round lesions, alopecia, with crusts and pruritus [11]. Case reports on isolation of *Microsporum canis* in non-human primates, mainly New World Primates, are rare in Brazilian Literature [8].

Treatment aims reducing environmental shedding with a combination of topical and systemic therapies, as well as, decontamination of the environment [6,7,19]. The fluconazole treatment proved to be effective as animals were cured and there were no side effects related. This case report shows the importance of a correct micological diagnosis in free-range animals as the detection of the likely source of infection.

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