

## Sporotrichosis In Brazilian Domestic Cats

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**Abstract:** Sporotrichosis is a fungal disease relevant to Public Health, since it is highly contagious to human beings and other animals. Felines are the most afflicted by the disease. There are different methods for diagnoses, as cytology, microbiological culture and fungal identification, polymerase chain reaction (PCR) and histology exams. Treatment is based in oral administration of antifungal medicines, being association of itraconazole and potassium iodine the main choice. The animal afflicted by the disease needs to be isolated from other animals as well as having the access to the animal restricted by only the ones who are medicating the patient. Castration needs to be performed in cats, so it will minimize fights and the super population. The purpose of this work was to perform a bibliographic survey about the disease and an epidemiologic search of felines affected with sporotrichosis in the Animal Health Project, along with report the tutor conscientization during the whole process of treatment. This study showed the efficacy of itraconazole and potassium iodide once administrated in the right way. The duration of treatment in felines was 3 months minimum. When practiced in the right way, the cure occurs in most animals, except when the patient shows dysfunction of the immune system, which is a big obstacle during the therapy. It is necessary the tutors comprehension about the duration of the treatment and the biosafety methods. Nowadays this disease grows more and more and in some places, there are epidemics.

**Keywords:** Sporotrichosis, feline, antifungal.

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### I. Introduction

Sporotrichosis has been increasingly affecting felines in recent years, and because of this, outbreaks are becoming more and more constant in cities, as is the case in Rio de Janeiro, a city where human sporotrichosis is considered a neglected endemic disease [1].

In the feline species, this disease occurs with a large number of yeast fungal cells, a fact that justifies the high transmissible power of the disease for both humans and other animals [2].

Disputes by territory in the streets and in the residences or by females that are estrus are normally harmful confrontations, causing injuries, constant stress, low immunity and consequently, greater contamination by a large number of pathogens when many animals are injured [3,4].

In Brazil, transmission of the disease to humans behaves in two ways: by direct contact with the diseased animal or by contact with the microorganism present in the soil [4].

The zoonotic transmission is due to the daily exposure to the fungus caused by the coexistence of man with cats in the intra or peridomiciliary environment, due to their high infective load and the numerous inoculations due to scratches and / or bites [5,6].

Freitas [1] in his work with humans in Rio de Janeiro found that, in 50 fungal cultures in the laboratory, most areas endemic for sporotrichosis, 45 were identified as *Sporothrix brasiliensis* and of these, 40 reported cat contact. The other results were *Sporothrix schenckii*.

The genus *S. brasiliensis* is the most active and predominant form that affects our felines, mainly in the South and Southeast regions of Brazil [7].

When a feline arrives at the veterinarian's office with ulcerated wounds scattered around the body, which do not heal easily, the first illness to be suspected is sporotrichosis. Due to other diseases of a dermatological nature (fungal infections and neoplasias) are similar to sporotrichosis, it is necessary to perform conclusive tests to give the diagnosis accuracy [8,9,10].

Among the diagnostic methods, cytology is a widely used method because it is relatively inexpensive, reliable with rapid result and non-invasive [9,10].

A histopathology with hematoxylin-eosin (H-E) staining allows us to observe pleomorphic fungal cells, about 3 to 5 µm, covered with a light-colored halo. The method used for Periodicacid-Schiff (PAS) staining demonstrates basophilic cell bodies, with peripheral halo in red color and center in light color [10].

During the growth of the physical colony in the culture medium of Sabouraud agar, it is verified the formation of several colonies initially with a film with aspect wrinkled, well resistant is able to attach to the middle of the culture. The coloration varies from brown to next to black. By means of the microscopy it is possible to verify the formation of fine and septate hyphae with ovoid conidia in their margin of tiny sterigmas on a conidiophore [10].

The literature affirms that the polymerase chain reaction (PCR) is a diagnostic method capable of analyzing the fungus by molecular recognition and, despite being an expensive diagnostic medium, provides the results of the analyzes faster when compared to other methods[10].

Treatment of sporotrichosis is by administration of oral antifungal drugs in both cats and dogs. The most commonly used medications are those derived from imidazoles, triazoles and iodides [10,11,12].

Alternative therapies are emerging with natural active substances with possible antimicrobial action, as effective as conventional drugs [13].

Cleff et al. [14] demonstrated in vitro antifungal activity of *Origanum vulgare* versus *Sporotrixschenkii*.

Couto [15] in his in vitro essays with essential oils of *Bacharistrimera* and *Origanum vulgare* found moderate antifungal action with morphological alterations similar to those resulting from conventional drugs in the fungal structures in the species *Sporothrixschenckii* and *S. brasiliensis*.

Bastos et al. [16], when tested in vitro the honey of Jataí bees (*Tetragoniscaangustula*), verified their efficacy against *Sporothrix* sp., with reduced fungal load.

The prognosis of feline sporotrichosis varies according to the stage and evolution of the animal's condition, which is reserved for good in cases where cats are at an early stage and with superficial lesions or poor in cases where the animal is immunosuppressed [17].

The epidemic of sporotrichosis with zoonotic transmission occurs since the end of the 20th century in Rio de Janeiro, affecting more socioeconomically disadvantaged regions [18].

The taking of measures to intervene in animal disease, such as a greater approach to tutors regarding castration processes, encouraging the adoption of animals, the use of screens on windows and high walls to avoid leakage, guidance on the duration of treatment and medication quality, will have a great impact on the current scenario, generating less costs to the health system and preserving the owners of domestic cats and their animals [5,10,18].

Actions to combat this disease, such as population control with castration campaigns, encouragement of adoption of animals, use of screens in windows and high walls to avoid leakage, orientation in relation to correct treatment, will be of great help in changing the present scenario, generating less costs to the health system and preserving the owners of domestic cats and their animals [5,10,18].

The objective of this study was to report the importance and the difficulties of treatment against feline sporotrichosis and the conscience of responsible ownership in the treatment of sick animals.

## **II. Materials And Methods**

This research was carried out from January 2016 to July 2017 in domestic felines living in the city of Teresopolis, State of Rio de Janeiro, Brazil, who were treated and diagnosed with sporotrichosis in the Animal Health Care Project at the Veterinary School-Clinic of University Center Serra dos Orgãos - UNIFESO.

The Animal Health Care Project of UNIFESO provides veterinary medical assistance to small animals in poor communities of the Teresopolis city-RJ.

Patient data such as location, sex, age, race, clinical symptoms, exams performed, prescribed medication and date of review for a new evaluation were obtained through the Animal Health Care Project data sheets. The examinations performed during the work were physical examination, cytology and fungal culture, performed in the laboratory of the school-clinic itself.

## **III. Results And Discussion**

Between January 2016 and April 2017, 316 consultations were performed on domestic dogs and cats by the UNIFESO Animal Health project, of which 102/316 (32.27%) were cats. Of the total of 102 felines, 18 (15%) were diagnosed with *Sporothrix* sp. while 84 (85%) had other diseases.

Regarding the localities of the origin of these felines, all the patients are resident in neighborhoods considered low income, most of the animals came from rescue and the major cause of contamination of the felines by *Sporothrix* sp. was by direct contact with other animals in the street, as Farias, Pereira and Giuffrida[10] warn about animals wanderers.

Felids treated during the period of this research had typical lesions of the disease, such as ulcerated or fistulant wounds, similar to those reported by Schubach, Menezes and Wanke[19] and in the location of affection corresponding to the sites described by Farias, Pereira and Giuffrida[10].

For two animals, the examination for diagnostic confirmation was culture, whereas, for the remaining sixteen, the cytology was performed in the clinic itself, according to Pereira et al. [5]. According to Farias, Pereira and Giuffrida[10] this technique, besides being reliable and non-invasive, also allows a short time and a low cost result.

Regarding the age of these animals, the veterinarians responsible for the care provided an estimate for the dentition of the felines, since most of the tutors were not sure about the correct age of the animal due to the adoption of adult animals.

In the contacts made during the consultations, many of those responsible for these cats reported not having so much difficulty in administering the drug. Many of them mentioned mixing the capsule or liquid in pan food or in moist cat food. Only one guardian has stated that she administers medicine through an exclusive applicator for the administration of oral tablets.

All tutors were informed that, from the time their animals were diagnosed positive for sporotrichosis, they would have to take their animals for consultation periodically. At the consultations, the evaluation of the evolution of the treatment and the clinical picture were performed, based on the improvements observed or remission of the disease.

Of the eighteen animals examined and diagnosed with a feline sporotrichosis escaped before starting treatment and two did not return after the first consultation, even with all the guidance passed by the veterinarian to the tutors on all the care and responsibilities that he should have during the treatment thus being out of statistics.

Of the fifteen felines followed up, four (26.7%) died during treatment, and eleven (73.3%) had success with total cure. The possible causes that may justify the deaths are the aggressiveness of the injuries by the body of the animal, inadequate administration of the drug due to leakage, irregular medication administration and poor diet as suggested by Farias and Pereira [9], Viana (2014 ) and Farias and Giuffrida[12].

For all animals, itraconazole 100mg was prescribed, one tablet per day for at least 90 days, the same pharmacological basis recommended by Farias and Pereira [9].

Only two animals received a medication of itraconazole associated with low dosages of potassium iodide, but potassium iodide was never used as a single therapy because, as Andrade [12]andVianna[20] state, this drug can cause toxicity in felines.

The association of potassium iodide was quite effective in the healing of the lesions, due to a synergistic antifungal action in the animal organism as Viana (2014) states.

The animals treated and cured during the period of this study continued to receive medication for another month, as recommended by Farias and Pereira [9], even though they had high clinical status.

For all animals, it was indicated that after completing the days of prescribed medication, the guardian would return for a new evaluation of the patient.

Figure 1 - Scabs with alopecia in the region above the right eye and at the base of the left ear



Source: Personalarchive, 2016.

Figure 2 - Lesion in the left region of the dorsum of the animal with granulomatous aspect



Source: Personalarchive, 2017.

**Figure 3** - Small area of alopecia in the lateral region of the right anterior limb



**Source:** Personalarchive, 2016.

**Figure 4** - Injury to the snout with presence of crust, and exposure of the musculature



**Source:** Personalarchive, 2016.

**Figure 5** - Feline with lesion at the base of the left ear with presence of crusts and exudative content



**Source:**Personalarchive, 2016.

**Figure 6**- Circular lesions around the eyes and left anterior limb



**Source:**Personalarchive, 2017

**Figure 8** - Feline with lesion in the nose region **Figure 9** - Feline with right ear injury with alopecia and presence of crusts



**Source:** Personal archive, 2017.



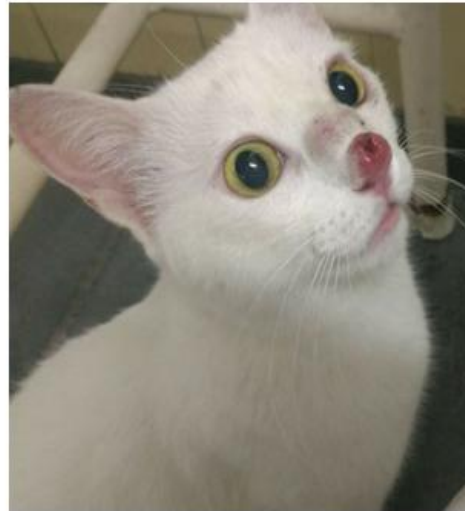
**Source:** Personal archive, 2017.

Figure 10 - Lesion with nasal sinus edema and lesion close to the right eye showing necrosis



Source: Personalarchive, 2017.

Figure 11 - Ulcerative lesion on the nose with bulging of the nasal sinus



Source: Personalarchive, 2016.

#### IV. Conclusion

Based on this survey it was observed that cases of sporotrichosis can be treated and properly cured. The treatment is prolonged, being of at least three months and, due to this, can appear obstacles that directly interfere in the cure of the feline.

The drug that obtains the best therapeutic response is itraconazole, and it is presently recommended in Brazil the dose of 100mg / cat. Ineffective treatments occur by resistance of the disease agent, or by incorrect administration (by mixing the drug in food or feed and thus not taking the required dose).

It is equally important that the guardian strive to provide appropriate treatment, taking into account the time and uninterrupted administration of the drug.

In this research report, it was possible to observe that some animals fled and did not return, due to imprudence or little commitment of the guardians. Therefore, it is of extreme importance the responsible ownership of any animal, where it must receive adequate food, fresh water in addition to veterinary assistance whenever necessary. Emphasizing that the abandonment and mistreatment of animals is a federal crime in Brazil, according to Art. 32, of Federal Law no. 9,605 of 1998 (Law on Environmental Crimes) and Art. 164 of the Penal Code, where the detention is scheduled from three months to one year and fine.

The matter must still have more importance, since it is also a zoonosis. It should be more addressed in lectures during community campaigns. Preventive measures such as castration for males and females from the age of six months should be more accessible, especially those guardians who are low-income. It is still necessary that there be more awareness about the high power of transmission of this disease, being indispensable the isolation of the animal.

In addition, the Veterinarian's role in the diagnosis and early treatment of the disease is fundamental. Sporotrichosis, when diagnosed early and treated quickly and effectively, tends to have good results as those obtained in most cases of the present study. Underscoring the importance of continuing medication for one month after healing of the lesions,

Due to the different subspecies described for sporotrichosis, new research is possible to be carried out for the approach of *Sporothrix brasiliensis* and *Sporothrix schenckii*, since later *Sporothrix brasiliensis* was identified at the Medical School of UNIFESO.

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