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Report

Combination of Systemic and Topical Treatment for Feline Dermatophytosis: A Case Report

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ABSTRACT

Dermatophytoses or ringworm are the most common fungal infections in dogs and cats. This zoonotic disease is called dermatophytosis. A 2 years old male Persian cat referred to the Veterinary Clinic Faculty of Veterinary medicine, Universitas Gadjah Mada with multi-focal circular non-pruritic skin lesions and hair loss mainly on the head and ears. A complete series of dermatologic tests such as Wood's light examination, direct microscopic examination, and fungal culture were performed. The cat was treated with itraconazole dosage orally for a period of 20 days and ketoconazole topical for 35 days, respectively. Thirty five days after treatments the cat showed reduction of lesions.
Keywords*:* Persian cat, dermatophytoses, itraconazole, ketoconazole

ABSTRAK

Dermatofitosis atau *ringworm* adalah infeksi jamur yang paling umum terjadi pada anjing dan kucing. Penyakit zoonosis ini disebut dermatofitosis. Seekor kucing Persia jantan berusia 2 tahun dirujuk ke Klinik Hewan Fakultas Kedokteran Hewan, Universitas Gadjah Mada dengan lesi kulit bukan pruritus *multi-focal* melingkar dan kerontokan rambut terutama di kepala dan telinga. Serangkaian tes dermatologis lengkap seperti pemeriksaan *Wood's light*, pemeriksaan mikroskopis, dan kultur jamur. Kucing tersebut diobati dengan *itraconazole* dosis per oral selama 20 hari dan *ketoconazole* secara topikal selama 35 hari. Tiga puluh lima hari setelah perawatan, kucing menunjukkan pengurangan lesi.
Kata kunci: kucing Persia, dermatofitosis, *itraconazole, ketoconazole*

INTRODUCTION

In companion animals, the skin diseases could be due to parasitism, bacterial, dermatophyte fungi, allergies, immunologic diseases, nutritional related dermatosis, hormonal disorders, and some skin cancers (Malinovschi *et al*. 2009). Dermatophytoses are the most common fungal infections in dogs and cats (Khosravi and Mahmoundi 2003), highly contagious but not life-threatening, treatable and curable, easily contracted by direct contact and of zoonotic importance (Moriello 2014). These fungi are classified according to their habitat in anthropophilic, geophilic, and zoophilic (Mattei *et al*. 2014). The main etiological agents are *Microsporum canis*, *Microsporum gypseum* and *Trichophyton menthagrophytes* (Lewis *et al*. 1991). A wide variety of dermatophytes have been isolated from animals, but the most common are *Microsporum canis* and *Trichophyton mentagrophytes* (Chermette *et al*. 2008). In domestic dogs and cats *Trichophyton mentagrophytes* is the third most common agent causing dermatophytosis, after *Microsporum canis* and *M. gypseum* (Pier and Moriello 1998; Soedarmanto *et al*. 2014). In captive settings, infections are usually associated with contact with humans or domestic pets.

The epidemiology of the dermatophytes is closely connected to its environment (Mattei *et al*. 2014). Hair is infected after exposure to fungal spores in the environment or from another animal, usually a cat. The disease usually affects younger cats, and it is presumed that the lower prevalence in older ones is because of acquired immunity through repeated exposure. These fungi share the ability to utilise keratin as a nutrient substrate, and the infection of keratinised tis¬sues is also termed ringworm (Sparkes *et al*. 1993). The skin lesions that appear are variable and do not necessarily form a ring. There will be hair loss, usually in small patches at first. There might be scratching due to itchiness. These infections are characterized principally by multifocal alopecia and scaling (Quinn *et al*. 2002). The diagnosis of dermatophytosis is unreliable on the basis of clinical signs exclusively, not only due to the variable nature of the dermatological findings, but also because there are several other skin diseases that mimic the typical dermatophytic lesion (Copetti *et al*. 2006). The laboratory identification of etiologic agents was based on micro and macroscopic characteristics. In addition, the urease and the in vitro hair perforation tests, the evaluation of nutritional requirements in culture, sugars assimilation, capability to growth at 37°C and the ability to produce germ tubes were also carried out to differentiate fungal species (Foil 1990). The antifungals commonly used in systemic treatment of dermatophytosis in dogs and cats include itraconazole, terbinafine and griseofulvin (Gupta and Del Rosso 2000).

CASE HISTORY

A 2-year-old male persian cat weighing 2 kg with suspected dermatophytosis was presented to the Veterinary Clinic Faculty of Veterinary medicine, Universitas Gadjah Mada. Physical examination revealed a patches of scalp hair loss, scaling, scratching, crusting the head and there is alopecia on the head and ears. Wood's lamp examination looks for fluorescence on the hair shafts infected hairs and showed green fluorescent on the head and ears. Examination with 10% potassium hydroxide (KOH) were negative for hyphae, microconidias and macroconidias. Complementary laboratory blood tests showed that the cat had no blood abnormalities as there was no other evidence of disease. Specimens taken from scraping lesions were inoculated onto Sabouraud dextrose agar and incubated at room temperature. After 7 days incubation, growth culture on Sabouraud dextrose were taken for microscopic examination to confirm the definitive diagnosis. In this case, we used a combination of oral and topical antifungal. The cat was treated for dermatophytosis with itraconazole 10 mg orally, once daily for 20 days and ketoconazole topical twice a day for 35 days, respectively.

RESULTS AND DISCUSSION

Physical examination revealed a patches of scalp hair loss, scaling, scratching, crusting the head and there is alopecia on the head and ears (Fig. 1). Classic lesions include one or more areas of partial alopecia with scaling and crusting most commonly on the head or forelimbs and lesions may be hyperpigmented (Moriello 2004). Diagnosis of dermatophytosis in this case was based on history, clinical examination and complementary aids, such as Wood's light, light microscope and fungal culture. In this case, Wood lamp examination showed green fluorescent on the head and ears (Fig. 2).

These results indicated that the fluoresence probably due to dermatophyte species including *M. canis*. According to Outerbridge (2006), when exposed to the light, hairs invaded by most of *M. canis*

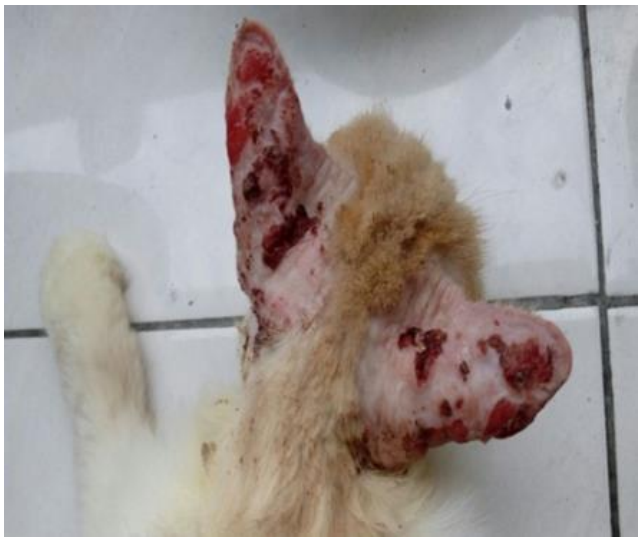

Figure 1 A patches of scalp hair loss, scaling, scratching, crusting, and alopecia on the ears

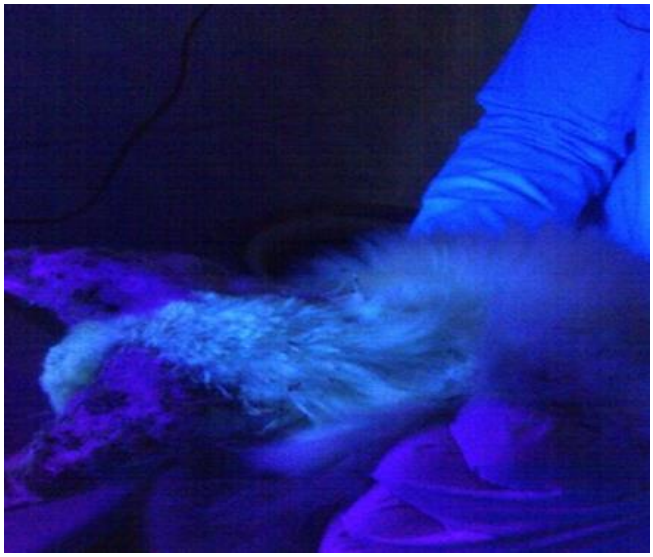

Figure 2 Green fluorescent on the head and ears

showed glow yellow green. However, the green fluorescene not only due to *M. canis* but also came from other materials. According to Gupta and Singh (2004) the Wood's lamp is useful in establishing a tentative diagnosis of dermatophytosis in dogs and cats but cannot be used to exclude this type of infection since some skin ointments and other materials will fluoresce and may give a false positive result. Therefore, examination with an ultraviolet lamp (Wood's lamp) was only used for screening method for dermatophytosis. Mycological culture remains the most reliable technique for confirming dermatophytosis in cats.

The samples were subjected to native light microscopy for detection of fungal elements (hyphae and arthrospores) after preliminary treatment with 10% KOH. The result of examination with 10% KOH were negative for for hyphae, microconidias and macroconidias. Nevertheless, these results could be false negative. Microscopic identification of fungal elements directly in clinical samples using potassium hydroxide 10% (KOH) is a quick method, but its specificity and sensitivity is low. Moreover, false negative results are possible. According to Levitt *et al*. (2010) the sensitivities for KOH smear and culture were 73.3%.

In this case, definitive diagnosis is made by fungal culture and was considered the "gold standard" for diagnosis. The most commonly used fungal culture media was Sabouraud's dextrose agar. Culture of the clinical specimen placed on Sabouraud dextrose agar showed a flat colony, white to cream in colour, with a powdery to granular surface (Fig. 3). These characters were like *Trichophyton mentagrophytes*. Weitzman and Summerbell (1995) noticed that the colony of *Trichophyton mentagrophytes* were plane, white to cream color, powdery to granular surface and reverse yellowish brown to reddish-brown in Sabouraud dextrose agar at 25°C. According to De Hoog *et al*. (2000), this fungi can be phenotypically identified through different tests, where, for instance, *T. mentagrophytes* is always urease-positive, unfortunately, in this case urease test was not performed. The isolates were examined for microscopic morphology using lactophenol cotton blue staining and the result showed macroconidias (Fig. 4). Although urease test was not performed, however, from microscopic examination we suggested that the culture was *Trichophyton mentagrophytes*.

In this case, combination of systemic and topical treatment were used on the basis of mycological analysis results and the clinical signs. A systemic oral therapy with itraconazole at a dose of 10 mg/kg, and topical treatment with ketoconazole twice a day. Borgers *et al*. (1993) suggested that topical therapy alone does not adequately penetrate the hair follicle and that optimal treatment of dermatophytosis caused by species that invade the hair follicle and

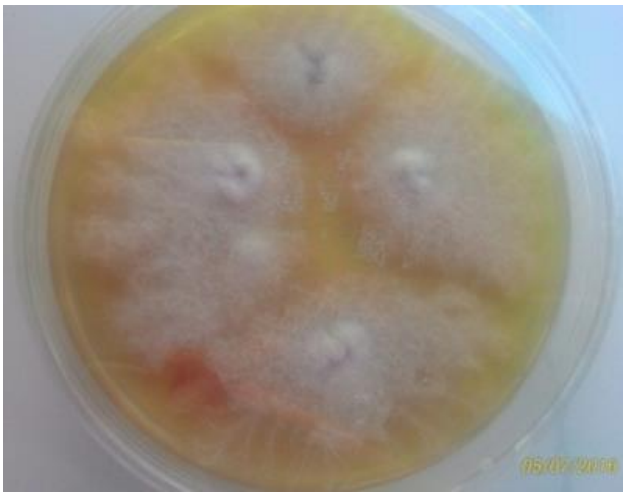

Figure 3 Sabouraud dextrose agar showed a flat colony, white to cream in colour, with powdery to granular surface

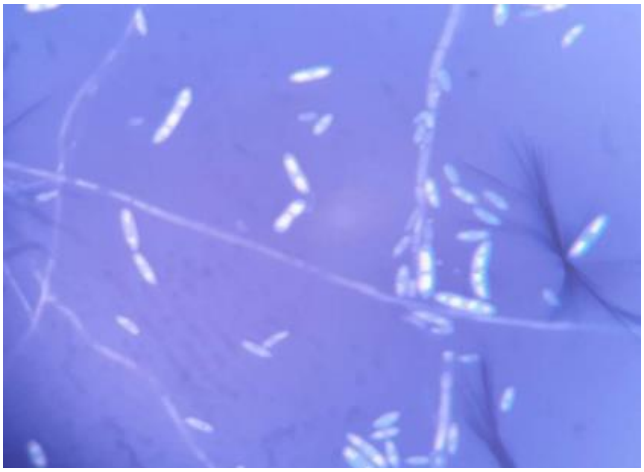

Figure 4 Lacto phenol cotton blue mount showing macroconidias

hair shaft (such as *M. canis*) requires systemic therapy for effective penetration to this site. After treated with itraconazole for 20 days and ketoconazole for 35 days respectively, the cat showed reduction of lesions (Fig. 5). According to Bond (2010), The treatment must be extended over 2 to 4 weeks after clinical cure and after obtaining two or more negative fungal cultures. Complete resolution was achieved after 42 days of itraconazole and ketoconazole treatment.

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"All authors declare that there are no conflicts of interest".

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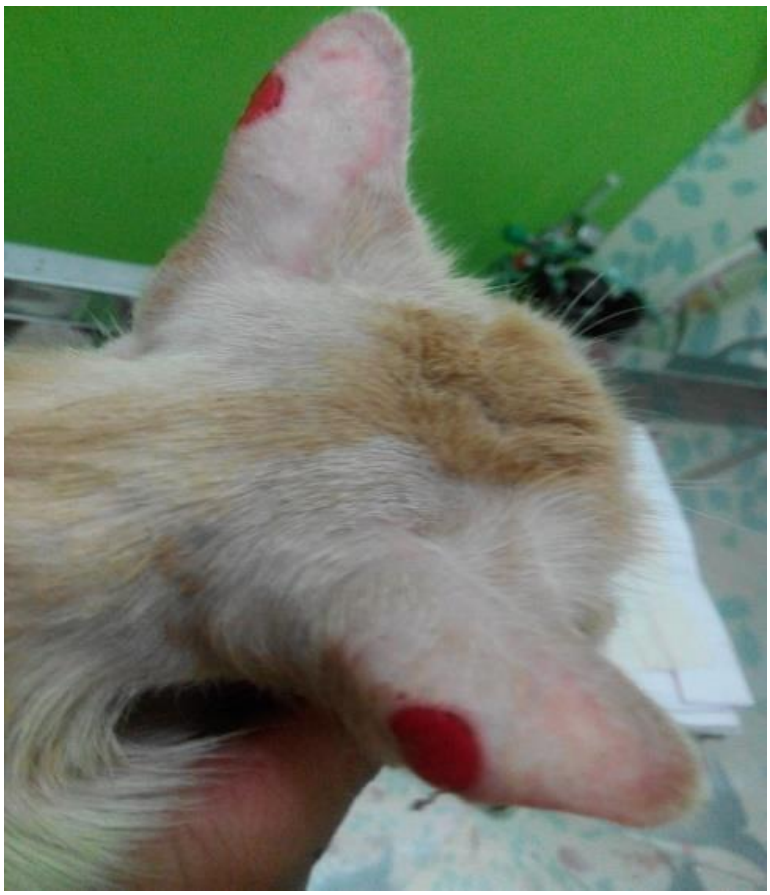

Figure 5 Thirty five days after combination treatments with itraconazole and ketoconazole for 35 days

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