

Incidence of dermatophytosis in canine cases presented at Apollo Veterinary College, Rajasthan, India

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Abstract

Aim: Ring worm are fungal infection relevant to animal and human health. The study was aimed to assess the frequency of dermatophytes infection of the skin of dogs in and around the Jaipur city.

Materials and methods: One twenty canine samples were obtained during three years (2008-2011) from dogs suffering from different dermatological disorders and were invitro processed for dermatophytes detection at the Department of Microbiology, Apollo College of veterinary medicine Agra Road, Jaipur.

Result: Out of these, eighty nine samples were positive respectively for *Microsporum gypseum* 55.83%, *Trichophyton mentagrophytes* 18.3% and other fungal isolate *Alternaria spp.* sporadic in 15 samples (0.12%). Retrospective studies of dermatophytosis due to *Microsporum* and *Trichophyton* were performed with the sole consideration of public health consequence of the canine ringworm.

Conclusion: In the present study samples were found positive for *Microsporum gypseum* 55.83%, *Trichophyton mentagrophytes* 18.3% and other fungal isolate *Alternaria spp.* Considering the veterinary and public health importance of canine ringworm it would be necessary to assess the prevalence of the dermatophytosis in Rajasthan.

Key words: dermatophytosis, dog, *Microsporum gypseum*, *Trichophyton mentagrophytes*,

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Introduction

Dermatophytosis is a specific fungal disease of the epidermal tissues in the skin and these are the most common agents of fungal infections worldwide [1]. Dermatophytes fungi demonstrate affinity for cornified epidermis and adnexal structures are common in dogs, cat and other animals and are documented communicable to the man [2]. Its incidence is related to the geographic region, climate and prevalent animal husbandry practices. It is frequently found in young, stray sick and debilitated animal. Dermatophytes belong to three genera: *Microsporum*, *trichophyton* and *epidermophyton*. The most frequently dermatophytes infestation in dogs are *microsporum spp.* and *trichophyton spp.* Fungi share the ability to utilise keratin as a nutrient substrate, and the infection of keratinised tissues is also termed ringworm [3]. 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 [4]. It's infection are hardly fatal but mostly debilitating and disfiguring disease that can give rise to permanent deformation if untreated [1].

Dermatophytes are significant due to their zoonotic potential and the concern of owner of pets with some time severe inflammatory diseases [5]. This study was aimed to assess the frequency of dermatophytes infection of the skin of dogs in and around the Jaipur city.

Materials and methods

During September 2008 to August 2011 one hundred twenty dogs with various skin lesions were examined at the department of veterinary microbiology, Apollo college of Veterinary medicine, Agra Road Jaipur. Breed, sex, age and clinical appearance of lesions were on spot recorded. All animal presented suspected skin disease (lesions are round with embossed edges and occurring in any part of the body).

Table-1. Percentage incidence of dermatophytes isolates.

Dermatophytes	Frequency of isolation n=120	Percentage (%)
<i>Microsporum gypseum</i>	67	55.83%
<i>Trichophyton mentagrophyte</i>	22	18.3%
Other fungal isolate <i>Alternaria spp.</i>	15	0.12%

A small sample of each scraping was digested in 20% potassium hydroxide (KOH) by heating and examined by direct microscopy in lactophenol cotton blue (LPCB) stain as per standard protocol [6]. Wet mount of each skin sample was prepared and examined for the presence of macroconidia and mycotic hyphae using standard techniques [6]. Simultaneously suspected samples were incubated at 27 °C and 37 °C for three to four weeks on Sabouraud's dextrose agar (Hi-media) supplemented with chloramphenicol (0.5 mg/ml) as well as cycloheximide (0.5 mg/ml) and were identified by the morphological characteristics of the thallus, hyphae, macroconidia and microconidia [2,6,7]. A definitive diagnosis of *microsporum* and *trichophyton* was based on complete laboratory testing, coupled with clinical findings and response to therapy.

Results and Discussion

All 120 dogs showed clinical evidence of characteristic skin lesions grossly visible as erythematous itching rings, irregular diffuse alopecic patches and scab formation.

Eighty nine dogs were positive for dermatophytes. Two fungal genera, *microsporum* and *trichophyton spp.* were observed pathogenic and highly prevalent. *Microsporum gypseum* infection was confirmed in 67 samples (55.83%) whereas 22 samples (18.3%) found positive for *Trichophyton mentagrophytes* infection (Table. 1). The other fungal isolate was *Alternaria spp* in 15 samples (0.12%). All patients were treated either with oral griseofulvin or ketoconazole or itraconazole. Use of topical antifungal and antibacterial antibiotics such as wokazole was often used as supportive therapy in complicated cases, exhibiting secondary microbial infection particularly those with bacterial infection.

Dermatophytosis is a common skin disease in dogs especially during spring and autumn. The clinical signs of dermatophytosis are extremely variable, and the owners many times unaware that their pet is infected until they themselves contract the disease. Higher prevalence rate of *microsporum gypseum* than *T. mentagrophytes* in dogs was confirmed in Madras [8] and in Turkey [9]. The presence of *T. mentagrophytes* in canine skin and hair samples was low in comparison

with *M. Gypseum* and *M. canis* [10]. Trichophyton infections were found lesser than *M. Canis* in Chennai [11], in Nigeria [12], in western turkey [13] and in Iran [14]. Our findings are contraindicatory to international reports of *M. Canis* infection [15,16]. It can be attributed to different geographical distribution of the pathogen in the study area. *Microsporum gypseum* is a geophilic dermatophyte, infest epidermal tissue and cause tissue mycoses in domestic livestock and pets [5]. The presence of *Alternaria spp* which are non dermatophyte contaminant fungal flora may be due to their ubiquitous nature of their spores in the environment. Saprobe fungi also recovered contaminant fungal flora from pets, which are commonly found in the environment [16,17]. It is suspected that environmental contamination provided constant exposure to a large source of organisms which contributed to the eventual relapse of the infection.

Dogs suffer a dermatophyte infection at any age, but ringworm infection is more frequent in the young [18,19]. In addition to age, risk factor includes poor nutrition, high density of animals, poor management and lack of an adequate quarantine period for infected pets [20]. The dermatophytes are transmitted by contact with infected hair, fomites (clippers, brushes) or from the environment (spores in soil). Dogs harbour many saprophytic moulds and yeasts on their hair coats and skin such as *Alternaria*, *Mucor* etc. These saprophytic isolates represent transient contamination by air borne fungi or by fungi in soil; some of them have potential allergenic activity [21].

Conclusion

In the present study samples were found positive for *Microsporum gypseum* 55.83%, *Trichophyton mentagrophytes* 18.3% and other fungal isolate *Alternaria spp.* Considering the veterinary and public health importance of canine ringworm it would be necessary to assess the prevalence of the dermatophytosis in Rajasthan.

Author's contribution

RG, PD and RS participated in the preparation of experimental design and the facilities of the research. RT and RG collected samples and send them to

laboratory for identification. RG, PD and RS involved in the identification of dermatophytes. RG and RLL analyzed the data, drafted and revised the manuscript. All the authors has read and approved the manuscript.

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Competing interests

Authors declare that they have no competing interests.

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