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Subha Ganguly

Associate Professor, Department of Veterinary Microbiology, Arawali Veterinary College (Affiliated with Rajasthan University of Veterinary and Animal Sciences, Bikaner), N.H. – 52 Jaipur Road, V.P.O. Bajor, Sikar, Rajasthan, India

Parveez Ahmad Para

Assistant Professor, Department of Livestock Products Technology, Arawali Veterinary College (Affiliated with Rajasthan University of Veterinary and Animal Sciences, Bikaner), N.H. – 52 Jaipur Road, V.P.O. Bajor, Sikar, Rajasthan, India

Shabu Showkat

Ph.D. Research Scholar, Division of Veterinary Public Health, Sher-e-Kashmir University of Agriculture and Technology- Kashmir (SKUAST-K), Jammu & Kashmir, India

Correspondence

Subha Ganguly

Associate Professor, Department of Veterinary Microbiology, Arawali Veterinary College (Affiliated with Rajasthan University of Veterinary and Animal Sciences, Bikaner), N.H. – 52 Jaipur Road, V.P.O. Bajor, Sikar, Rajasthan, India

Mycological investigation of dermatophytosis in Dog: A case study

Subha Ganguly, Parveez Ahmad Para and Shabu Showkat

Abstract

Dermatophytosis is a superficial infection of the keratinized layers of the skin and its appendages (hair, feathers, horns) of farm, domesticated and wild animals and birds. The lesions are frequently ring shaped, hence the disease is called ring worm. Dermatophytes are filamentous fungi which invade keratinized tissues of humans and animals, causing mild to severe, localized and/or diffuse infections. Dermatophytes are non-invasive cannot survive in living tissues nor in areas of intense inflammation and they have keratolytic activity. Infection is generally restricted to the non-living cornified layers. The present article reports on the laboratory examination of skin scraping sample collected from a dog suspected of superficial infection with dermatophytes.

Keywords: Dermatophytes, Dog, Fungus, Skin scraping

1. Introduction

Some dermatophytes are zoonotically important which infect primarily the animals and are transmitted from infected animals to human beings on many occasions [1]. Dermatophytosis is the clinical manifestation of the superficial infection on skin caused by the fungi of anamorph genera namely, *Microsporum*, *Trichophyton* and *Epidermophyton* [2, 3]. In dogs, nearly 70% of cases are caused by *Microsporum canis*, 20% by *M. gypseum*, and 10% by *Trichophyton mentagrophytes* [4]. The Wood's lamp test is of diagnostic importance for the establishment of a tentative diagnosis of dermatophytosis in dogs. Confirmatory diagnosis requires the use of DTM culture. In asymptomatic carrier animals the infection can be diagnosed by brushing the coat with a new toothbrush followed by inoculation of the DTM culture plate. This can be done by pressing the bristles containing the collected hair and scales to the surface of the medium [5].

2. Materials and Methods

The non-descript breed of dog having the history of skin infection brought by its owner for clinical examination at the Teaching Veterinary Clinical Complex (T.V.C.C.) of Arawali Veterinary College, Sikar during February, 2017. The patient revealed the presence of round raised areas of hair loss, irregular patches of hair loss, scaly and/or crusty skin with inflamed hair follicles, pustules on the skin. The skin scrapings were collected from the scaly and alopecic lesions on the skin of the affected dog. The collected skin scraping samples were then forwarded to the Department of Veterinary Microbiology of the college for mycological examination and reporting.

The samples were examined by direct microscopical examination by placing the skin scrapings and/or hairs in 20% KOH on a glass slide and gentle heating, without boiling. Boiling may cause precipitation and crystal formation that will make examination of specimens difficult [6]. Superchrome blue-black ink or a simple stain mixed 1 part in 9 parts of KOH was used to examine the fungus elements and spores in scrapings, if any. The cover slip was placed on the preparation and examined under low power magnification.

The sample after incubation in Sabouraud's dextrose broth was then inoculated on Sabouraud's dextrose agar by spread plate method. The acidity of the agar inhibited the growth of most bacteria and encouraged the growth and culture of dermatophytes [7]. The dermatophyte identification was made based on the colony characteristics and microscopic features of the fungal isolates according to the methods described by Rippon [8] and Larone [9].

3. Results and Discussion

The incubated Sabouraud's dextrose broth sample was subjected to spread plate culture on Sabouraud's dextrose agar (SDA) media with chloramphenicol and cyclohexamide. The media was incubated at 27°C for two weeks. Staining with crystal violet dye mixed 1 part in 9 parts of KOH outlined the fungus elements and spores (arthrospores) microscopically in the scrapings. The fungal colonies were obtained on SDA followed by incubation at 35°C for 72 hours. It revealed the presence of characteristic colonies spreading in nature with characteristic greyish-white cottony woolly mycelia after incubation. On SDA media, colonies were small, button shaped, white to cream-coloured colonies with a velvety surface, raised centre and flat periphery.

Microscopic examination of the colonies revealed positive mycotic structures spherical, pyriform to calvate often of irregular shape which is characteristic of *Trichophyton* spp^[10, 11]. The first case of animal dermatophytosis caused by an anthropophilic species was described by Kushida and Watanabe^[12]. The authors reported the isolation of *Trichophyton rubrum* Cabanˆes^[13] and Kano *et al.*^[14] described *T. rubrum* infections in dogs. These animals may have acquired dermatophytosis after direct or indirect contact with an infected human, as molecular typing suggested that isolates of *T. rubrum* from both sources were genetically identical^[15].

4. Conclusion

The present study revealed the presence of superficial dermatophyte skin infection in the affected dog. Topical fungicidal ointments were recommended to T.V.C.C. for application in the affected dog for at least 4 to 6 weeks. Some topical solutions that have been found effective against dermatophytosis include sulphur sulphide, combinations of chlorhexidine with miconazole and chlorhexidine-ketoconazole.

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