CUTANEOUS CANDIDIASIS IN CAMEL (*CAMELUS DROMEDARIUS*) CALVES[#]

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ABSTRACT

A study was conducted during the year 2015-2016 in the village adjacent to Bikaner, Rajasthan. A total of 16 dermal mycoses infected camels of either sex or different age group were included in the present study. Out of 16 infected cases, two cases were infected with skin candidiasis. Both cases were below the age of one year and emaciated. Dermal mycoses occur in majority of the camels during post rainy season. The lesions were hard and fibrous crusts with papules accompanying alopecia.

Key words: Candidiasis, camel, dermal mycoses

Introduction

Dromedary camel is well adapted than any other domestic animal to the arid and semi-arid regions of the Rajasthan state of the India (Tuteja *et al*., 2015). In their natural habitat camels are exposed to severe stress conditions which render them susceptible to many diseases (Abbas *et al.*, 1993 and Agab, 1993). The skin surface acts as anatomic and physiologic barrier between the animal and environment. Camelids like other livestock are exposed to a range of skin affections. Bacteria, viruses, parasites and fungi cause the skin affections. Amongst skin infections, fungal infections are more prevalent than the bacterial infections. Young animals are more prone to infection than adults, which could be related to the development of a stronger immunity in older animals due to the multiplicity of contacts with the fungus rather than an intrinsic role of age (Descamps *et al.,* 2003; Moriello *et al.,* 2003). Skin candidiasis is an acute and contagious fungal skin infection of camel calves of less than one year of age, which causes morbidity in terms of reduced weight gain. Skin candidiasis is coused by *Candida albicans*, it is a dimorphic fungus that grows both as yeast and filamentous cells. Lesions of the disease are initially observed on the back near the hump; later on the lesions extend towards the abdomen and may cover the whole body. It may lead to bleeding and ulceration of skin and may result in weakness and debility of calves and when infection occurs in a herd it affects almost every young calf in that particular herd. Self cure has been observed in most of the cases (Tuteja *et al.,* 2010). Wernery *et al.* (2007) reported failure in the treatment of skin candidiasis in dromedary calves despite intensive treatment; the lesions did not heal until a year later, when the dromedary calves changed their fur. It is also called 'thikria' by camel keepers. This vernacular word means broken piece of an earthen pot or pitcher, its shape resembles with lesion.

Materials and Methods

The present investigation was carried out on 16 cases of camels affected with dermal mycoses (irrespective of sex, age and breed) from Motigarh village of Bikaner district, an arid desert region of Rajasthan. The camels which showing peculiar skin lesion of mycoses along with other sign and symptoms of pruritis, alopecia were included in the study. All the relevant samples and photography of the lesions where thought necessary were collected. Confirmation of dermal mycoses was done on the basis of direct microscopic examination and cultural examination of skin scrapings.

Collection of samples

In affected camels with clear skin lesions, debris and or faecal materials present were first removed with an alcohol wipe. Then using a blunt scalpel lesions were firmly scrapped, particularly at the advancing border. If multiple lesions were present then the most recent were chosen for scrappings as old loose scale is often not satisfactory. The tops of any fresh lesions were removed as the fungus is often plentiful in the roof of the lesions. These samples were collected in sterile vials meant for sterile collection of clinical samples.

Direct microscopic examination

It was performed by placing the scrappings on a glass slide with two or three drops of 20 per cent potassium hydroxide and placing a cover slip over it. The sample was warmed for five minutes over a flame and was then carefully examined microscopically for the presence of hyphae and/or arthroconidia.

Cultural examination

Samples were first mixed with Sabouraud's dextrose chloramphenicol broth and were incubated for up to 24 hours. Then these samples were inoculated onto Sabouraud's dextrose chloramphenicol agar (SDCA) plate and were incubated at 25^0C for 15 days. These plates were examined daily for the growth of the fungi. The resultant growth was examined for the colony morphology. Microscopic examination was carried out using either lacto phenol cotton blue or calcofluor white stains using wet mount method (Halley and Standard, 1973). Fungal species were identified on the basis of colony morphology and microscopic characteristics (Colin *et al*., 2013).

Results and Discussion

Out of the total 16 cases of dermal mycoses investigated two cases were infected with *Candida albicans.* Lesions of

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the disease are initially observed on the back near the hump; later on the lesions extend towards the thigh and extended to legs (Fig. 1). Lesions were initially round in shape and measure less than one centimetre in size which may enlarge to more than 10 centimetres in size and may co-alsace. The lesions were hard and fibrous crusts with papules accompanying alopecia. Scrapping the lesion with scalpel reveals foul smelling blackish brown dry crusts bunched with hairs along with roots. In prolonged cases it causes itching, uneasiness and may lead to bleeding and ulceration of skin. In present study both skin candidiasis affected calves were below the one year of age and emaciated in nature. Macroscopically colonies on SDCA were appearing glistening and smooth with white cream to brown colour in front view of plate (Fig. 2). Microscopically branched pseudohyphae with dense verticils of blastoconidia. Spherical chlamydospores, mostly terminal, often on a slightly swollen subtending cell, were formed near the edge of the cover slip (Fig. 3). Morphological character of colony and microscopic finding are similar to *Candida albicans* as described by Colin *et al.* (2013).

Wernery *et al.* (2007) repeatedly cultured *Candida albicans* from skin scrappings of very young camel calves. The physical condition of dromedary calves was affected; they were smaller and weighed less than calves in the same age group. Similar occurrence of skin candidiasis in young camel calves has been reported from India with almost similar signs and symptoms (Tuteja *et al.*, 2010; 2012). Pal *et al.* (2007) reported a case of otitis in camel due to *C. albicans*. Khosravi *et al.* (2008) recorded 18.6% of external ear canal of camel harboring *C. albicans.* Khosravi *et al.* (2009) isolated *C. albicans* from 5.8% of healthy eye and 10.9% of healthy nose samples of camels.

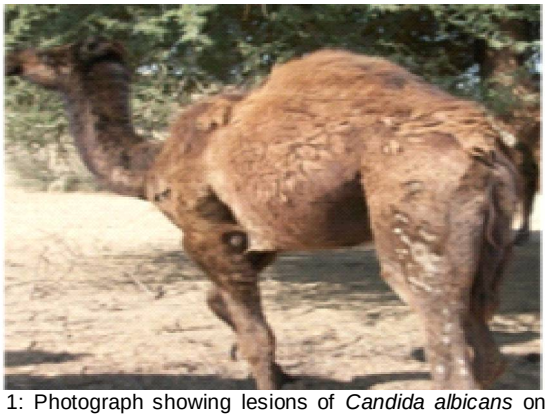

Fig. 1: Photograph showing lesions of *Candida albicans* on legs

Fig. 2: Photograph showing colony of *Candida albicans* (front view 15 days)

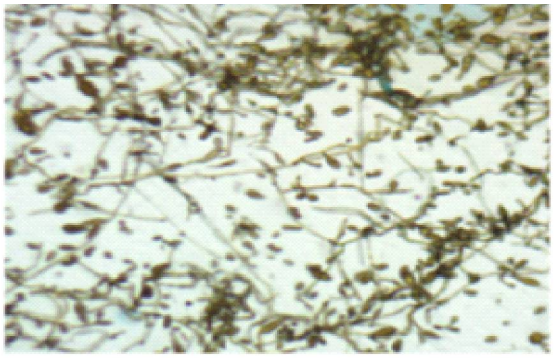

Fig. 3: Microphotograph showing chlamydospores at tip of hyphae of *Candida albicans*

References

Abbas B, Saint-Martin G and Planchenauct D (1993) Constraints to camel production in eastern Sudan: a survey of pastoralists conception. *Sudan J. Vet. Sci. Anim. Husb*. **32**(1): 31-41.

Agab H (1993) Epidemiology of Camel Diseases in Eastern Sudan with Emphasis on Brucellosis. M.V.Sc. Thesis submitted to University of Khartoum. pp.172.

Colin K, Campbell, Elizabeth M, Johnson David W and Warnock (2013) Identification of pathogenic fungi, 2nd ed. Wiley Blackwell Publication U.K.

Descamps F, Brouta F, Vermout S, Monod M, Losson B and Mignon B (2003) Recombinant expression and antigenic properties of a 31.5-kDa keratinolyti subtilisin-like protease from *Microsporum canis*. *FEMS Immunol. Med. Microbiol*. **38**: 29-34.

Halley LD and Standard PG (1973) Laboratory Methods in Medical Mycology. 3rd ed. U S Department of Health, Education and Welfare, Center of Disease Control, Atlanta, pp. 41-57.

Khosravi AR, Shokri H and Sharifzadeh A (2009) Fungal flora of the eye and nose of healthy dromedary camels (*Camelus dromedaries*) in Iran. *J. Camel Pract. Res.* **16**: 63-67.

Khosravi AR, Shokri H, Ziglari T and Niasari-Naslaji A (2008) A study of mycoflora of the external ear canals in dromedary camels in Iran. *J. Camel Pract. Res*. **15**: 153-157.

Moriello KA, DeBoer DJ, Greek J, Kuhi K and Fintelman M (2003) The prevalence of immediate and delayed type hypersensitivity reactions to *Microsporum canis* antigens in cats. *J. Feline Med. Sur.* **5**: 161-166.

Pal M, Patil DB, Kelawala NH, Parikh PV, Barvalia DR and Patel DM (2007) Occurrence of fungal otitis in camels. *J. Camel Pract. Res*.**14**: 73-74.

Tuteja FC, Dahiya SS and Narnaware SD (2015) Prevalence of bacterial and fungal diseases in dromedary camels in the Rajasthan state of India. *Vet. Pract.* **16**(1): 28-32.

Tuteja FC, Nath K, Chirania BL, Patil NV and Sena DS (2012) Skin candidiasis (Thikria) in dromedary calves. *J. Camel Pract. Res*.**19**: 243-247.

Tuteja FC, Pathak KML, Ghorui SK,Chirania BL and Kumar S (2010) Skin candidiasis in dromedary camel calves. *J.Camel Pract. Res*. **17**: 59-61.

Wernery U, Kinne J and Nagy P (2007) Candida dermatitis in camel calves- A case report. In: proceedings of the Int. Camel Conference. Recent trends in camelids research and future strategies for saving camels, Bikaner, Feb.16-17.pp. 226