

Short Communication

SKIN CANDIDIASIS IN DROMEDARY CAMEL CALVES

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Skin candidiasis is an acute and contagious fungal infection of camel calves of less than one year of age. Infection affects almost every young calf in that particular herd. It is also called thikaria by camel keepers. This vernacular word means broken piece of an earthen pot or pitcher; its shape resembles with lesion.

The literature on fungal diseases in camels is scarce. The skin of animals is contaminated by numerous fungi, some of which are opportunistic pathogens or allergens. Several other workers have reported the occurrence of dermatophytes on the apparently healthy skin of domestic and wild animals (Abdullah *et al*, 1971; Mariat *et al*, 1976). As grossly observed in very young camel calves at an organised farm, as well as in field conditions this disease was briefly investigated and observations were recorded.

Materials and Methods

Young calves of less than one year age at a well managed camel farm, as well as in the field conditions were observed for the type of lesions. Prevalence of the disease and relevant managemental practices adopted by the farmers were recorded.

Isolation and identification of fungi: Skin tissues from active lesions 15 infected camels (12 females and 3 males) were cut with sterilised scissors and scalpel and collected samples were initially examined for fungus identification in 10% KOH. Each tissue sample was processed for isolation and identification for fungi using Sabouraud's dextrose agar. These plates were incubated for 15 days at 25°C. The resultant growth was examined for the colony morphology. Microscopic examination was carried out using lactophenol cotton blue stain.

Treatment was carried out as per standard treatment procedure for fungal infection with slight modifications and incorporating the knowledge used by the farmers.

In vitro antifungal sensitivity of 8 isolates was carried out against 6 antifungal agents (Itraconazole-10µg, Amphotericin B-20µg, Nystatin-100units, Ketoconazole-10µg, Fluconazole-10µg, Clotrimazole-10µg) using antifungal sensitivity test agar (HiMedia Laboratories, Bombay) by the method of Bauer *et al* (1966).

***In vitro* antifungal activity of herbs:** Methanol extract of traditional medicinal herbs *viz* *Ocimum sanctum*, *Withania somnifera*, *Datura metel*, *Ficus religiosa*, *Punica granatum* and *Prosopis juliflora*, *Allium sativum* and *Aloe barbadensis*, were tested for antifungal sensitivity testing against 8 isolates using antifungal sensitivity test agar. The procedure for antifungal sensitivity was based on that of Novarro *et al* (1996). Results were interpreted as positive when diameter of zone of inhibition was more than 10 mm with 10µl of the methanol extract used (Tuteja and Dixit, 2009).

Results and Discussion

Lesions of the disease were initially observed on the back near the hump, later on the lesions extended towards the abdomen and covered the whole body (Fig 1). Lesions were initially round in shape and measured less than one cm in size which enlarged later on to more than 10 cm in size and coalesced. The lesions are hard and fibrous crusts with papules accompanying alopecia. Scraping the lesion with scalpel revealed foul smelling blackish brown dry crusts bunched with hairs along with roots. In long standing cases it caused itching, uneasiness and led to bleeding and ulceration of skin (Fig 2) and resulted in weakness and debility of calves (Fig 3).

Survey in camel populated areas revealed its widespread prevalence in Rajasthan. Farmers interviewed opined that it is usually a self limiting disease, and the self cure occurs after rains. Self cure generally occurs during fur replacement. Moreover, in the herds surveyed none of the calves born in previous year had this infection, whereas in the same

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Fig 1. Initial Stage of lesions.



Fig 2. Initiation of bleeding from lesion.



Fig 3. Weakness and debility of calf.

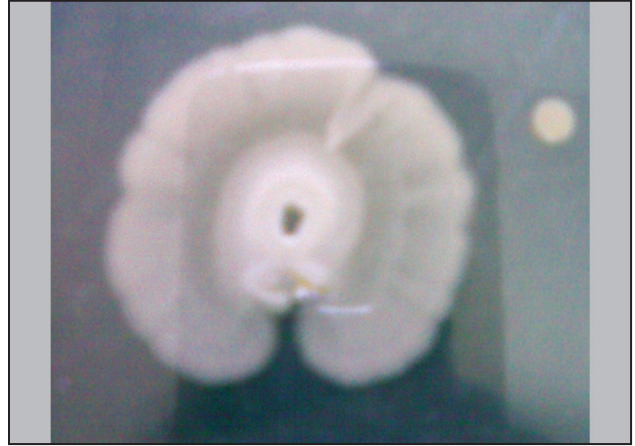


Fig 4. 12 day colony of Candida on Sabourauds dextrose agar.

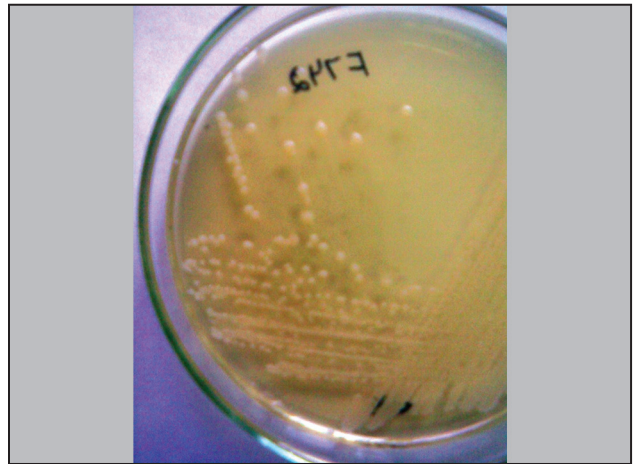


Fig 5. Creamish mucoid colonies of Candida at 24 hour.

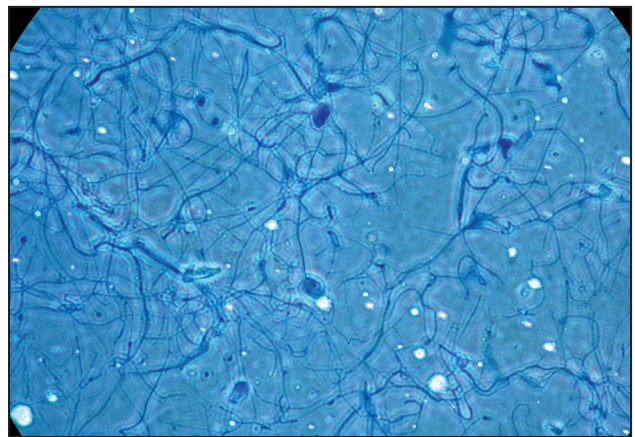


Fig 6. Microscopy of Candida (40x lactophenol cotton blue stain).

herd recently born calves had this infection. Lactating camels living in close contact with their infected suckling off springs were not infected.

Farmers believed that it causes only morbidity in young suckling calves. At well managed camel farm, comparison of growth of 5 infected calves with 7 healthy calves at one year of age revealed that

physical condition of calves was severely affected. Taking into consideration the age, sex and breed parity of calves, average weight gain was less in infected calves (256.6 ± 12.84 kg) compared to healthy calves (301.149 ± 6.09 kg) under same managerial conditions. However, the occurrence was more in female calves in number as well as in severity.

Repeated culture of skin scrapings on SDA from all infected calves led to isolation and confirmation of *Candida albicans* (Figs 4-6).

The ethno-veterinary treatment consisted of application of either sulphur in mustard oil, mustard oil alone or engine oil and the farmers found it very effective. Any oily base is mostly preferred by the farmers.

Following treatment was given in 5 severely affected cases of calves of approximately 6 month of age. Initially entire dead tissue was removed by scraping and a spray bath was made with 10% sodium thiosulphate. Next day an ointment made of sulphur- (6 gm) + salicylic acid- (3 gm) + mustard oil- (100 ml) was applied on the affected skin daily for 5 days. On the 7th day again spray bath was done with 10% sodium thiosulphate and the same ointment was applied daily for next 6 days. Then skin scrap was removed and 10 per cent sodium thiosulphate was applied daily for next 2 days. Along with this treatment mineral mixture feeding was done daily for 30 days at the rate of 20 gm per calf per day. This treatment schedule resulted in complete recovery of lesions in all the 5 cases. Recurrence of the condition in these calves was not observed up to one year of age.

In vitro antifungal sensitivity: a zone of inhibition of 14 mm or more with clotrimazole was observed for all the isolates.

In vitro antifungal activity of herbs: A zone of inhibition of 10 mm or more with *Datura metel*, *Punica granatum* and *Prosopis juliflora* was observed for all isolates.

In human beings, *Candida albicans* is a fungus that is normally present on the skin and in mucous membranes such as the vagina, mouth or rectum. The fungus can also travel through the blood stream and affect the throat, intestines, and heart valves. *Candida* becomes an infectious agent when there is some change in the body environment that allows it to grow out of control. This is called thrush when it grows in the mouth, especially in infants. On skin it causes red, inflamed, and sometimes scaly rashes.

Occurrence of skin candidiasis in very young calves may be attributed to poor immune status of dromedary calves. Wernery *et al* (2007) repeatedly cultured *Candida albicans* from skin scrapings of very young camel calves. Despite intensive treatment, the lesions did not heal until a year later, when the dromedary calves changed their fur. The physical condition of dromedary calves was affected; they were smaller and weighed less than calves in the same age group.

Pal *et al* (2007) reported a case of otitis in camel due to *Candida albicans*. Khosravi *et al* (2008) recorded 18.6% of external ear canal of camel harbouring *Candida albicans*. Further, Khosravi *et al* (2009) isolated *Candida albicans* from 5.8% of healthy eye and 10.9% of healthy nose samples of camels.

Yagoub and Mohamed (1996) found that all the ages and both sexes were susceptible to contagious skin necrosis. The disease was recorded in all season with increase in rate towards the end of autumn and early winter. The predominant organisms isolates were *Staphylococcus* spp, *Streptococcus* spp, *Corynebacterium pyogenes*, *Nocardia cameli* and *Erysipelothrix* spp. This skin infection could be some different condition.

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