

Tinea manuum in a veterinarian caused by *Trichophyton verrucosum*

Pratibha Dave and Mahendra Pal*

Welfare Hospital and Research Center, Bharuch-392001, Gujarat, India

*Present Address: Department of Microbiology, immunology and Public Health, College of Veterinary Medicine, Addis Ababa University, P.B. No.34, Debre Zeit, Ethiopia

Corresponding author: Prof. Mahendra Pal:

Abstract

This paper delineates the etiologic role of *Trichophyton verrucosum* in the etiology of dermatophytosis in a young male veterinarian from Gujarat, India. The epidemiological investigation revealed that the patient contracted the infection while collecting the skin scrapings from ringworm affected Holstein Fresian calf. Direct microscopical examination of the skin scrapings from the lesions of veterinarian, and affected calves in potassium hydroxide showed the presence of thin, hyaline, branched hyphae of dermatophyte; and cultural isolation on Sabouraud medium yielded the pure growth of the pathogen. The detailed microscopic morphology of isolates from human and animal in "NARAYAN" stain confirmed the isolates as *T. verrucosum*. The topical application of 1% luliconazole ointment, and 2% solution of tincture iodine on the cutaneous lesions of man, and animal respectively, showed good clinical response. It is recommended that ringworm in humans with a history of occupational exposure with animals should be examined for the zoophilic dermatophytes. The emphasis is given on the wider application of "NARAYAN" stain in Public Health and Microbiology laboratories for studying the detailed morphology of fungi implicated in many disorders of humans as well as animals. As zoophilic dermatophytes are highly communicable, the persons dealing with animals must take necessary precautions to avoid the transmission of infection.

KEY WORDS :Cattle, Dermatophytosis, Narayan stain, Tinea manum, Veterinarian

Introduction

Skin diseases of multiple etiologies are frequently encountered in medical, and veterinary clinical practice. Among this, dermatophytosis (ringworm, tinea) is an important, highly contagious cutaneous mycotic disease of humans, and a wide variety of animals (Pal, 1987; Pal and Lee, 2000; Pal, 2007; Pal *et al.*, 2013). The disease is caused by three genera of dermatophytes, namely *Epidermophyton*, *Microsporum*, and *Trichophyton* (Pal, 2007); and is important from public health and economic point of view. Dermatophytosis occurs both in sporadic and epidemic form (Pal and Thapa, 1993; Chouaki *et al.*, 1999, Rajpal *et al.*, 2005; Pal, 2007; Dalis *et al.*, 2014), and is reported from over 145 nations of the world including India (Hasegawa, 1980; Masten, 2000; Pal and Dave, 2006; Pal, 2007; Jain *et al.*, 2014). The infection can be acquired through direct contact with sick animals or indirect contact with contaminated fomites (Pal and Dave, 2006). Healthy cats and dogs may remain asymptomatic carrier of dermatophytes, and thus pose a great risk to human beings particularly those who remain in contact with pet animals (Pal, 2007). *Trichophyton verrucosum* is known to persist in environment for several years, and has been isolated from the soil (Singh and Kushwaha, 2010). The direct contact of the macerated or traumatized skin with such contaminated soil can be the source of transmission. The present communication describes the direct transmission of *T. verrucosum* infection from the diseased cattle to human.

Materials and Methods

A 27-year-old male patient who was working as Veterinarian visited the Skin Outdoor Patient Department (OPD) for diagnosis and treatment. The patient had one lesion on the skin of right wrist. He applied antibiotic and corticosteroid ointment on the lesion for about one week, but there was no clinical improvement. The patient was asked to get routine examination of blood, urine, and stool. As narrated by patient, he probably acquired infection from a 4-month-old female calf. Skin scrapings were collected aseptically from the margin of the lesions both in man and animal. A part of specimen was treated with 10 % potassium hydroxide (KOH) solution, and was examined microscopically for ectoparasite, fungi, and algae. The remaining material was inoculated on the slants of Sabouraud dextrose agar with chloramphenicol, actidione, and thiamine; and incubated at 25 and 37°C. The microscopic morphology of cultural isolates was done in 'Narayan' stain (Pal, 2004). It contained 0.5 ml of methylene blue (3% aqueous solution), 4.0 ml of glycerine, and 6.0 ml of dimethyl sulfoxide. The isolates were identified as per the procedure recommended by Baxter and Rush-Munro (1980), and Pal (2007). The chemotherapy in human and animal was done for three weeks with 1% Luliconazole ointment (Ranbaxy), and 2% solution of tincture iodine, respectively.

Results

On clinical examination, patient showed one discrete, erythematous, and scaly patch on the wrist of right hand. The examination of patient lesion under Wood's lamp did not exhibit any fluorescence. The patient was healthy as laboratory tests were non-committal. The microscopical examination of KOH wet mount did not reveal any ectoparasite, algae, yeast but showed thin, lender, hyaline, branched hyphae morphologically simulating to dermatophytes. Small, compact, heaped, white or grey colonies grew on Sabouraud medium from human and animal specimens after three weeks of incubation. Human and animal isolates in 'Narayan' stain showed rat tail shaped macroconidia, tear shaped microconidia, and antler like branched hyphae, and were identified as *T.verrucosum*. Both human and animal patients showed good clinical response with topical drugs. We did not conduct mycological monitoring for the efficacy of drugs in used in treating ringworm infection in human and animal.

Discussion

Dermatophytosis is a global health problem affecting both sexes, all age groups; and disease occurs in all seasons, in climatic zones, and rural and urban settings. The warm and humid climate of India is very conducive for the survival and growth of many fungi including dermatophytes (Pal, 2007). The close contact of human with animal is the most important risk factor for the transmission of zoophilic dermatophytes. In the present investigation, the ringworm infection due to *T.verrucosum* in a young male veterinarian (27- years- old) after handling the diseased cattle clearly elucidated the highly infectious nature of animal dermatophytes. The earlier reports of Rajpal and others (2005), and Jain and co-workers (2014) go parallel to our findings that tinea infections are more frequently observed in the age group of 21-30 years. In this context, Pal and Dave (2006) established the anthroozoonotic significance of *T.verrucosum* by reporting the direct transmission of this zoophilic dermatophyte from sick calf to his owner. Zienicke and Korting (1989) have described intrafamilial transmission of *T.verrucosum* infection to a newborn baby due to occupational exposure. It was interesting to note that isolates of *T.verrucosum* from human and animal did not reveal any difference, in their gross and microscopic morphology, and thereby, confirming that veterinarian contracted infection from the diseased calf. We had no facility for molecular typing of human and animal isolates. It seems imperative that development of the skin lesions after direct exposure with animals need thorough mycological investigation to confirm the etiologic role of zoophilic dermatophytes in the human

ringworm. In a very recent review paper, Pal and other (2013) mentioned that dermatophytosis is an important occupational fungal zoonosis of butchers who deal with livestock.

Conclusion

The isolation and identification of *T.verrucosum* from skin lesions established the zoonotic role of this zoophilic dermatophyte in ringworm infection of man. Retrospective epidemiological investigation confirmed that veterinarian had contracted infection from diseased calf. As 'Narayan' stain is cheaper, and easy to prepare than other mounting fluid, its routine application in all the laboratories dealing with fungi is highly emphasized. Further studies on the development of cheap, safe, and effective drugs for the treatment of ringworm in human and animal is suggested as currently used drugs in human practice are very expensive which can not be afforded by poor resource nations.

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