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Microsporum canis Infection in a Horse and its Transmission to Man

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말에 있어서 *Microsporum canis* 감염증과 사람에의 전염

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요 약 : 젊은 말과 그 관리인에게 발생한 *Microsporum canis* 감염에 의한 백선에 대해 보고하였다. 말과 사람에 있어서의 진단은 피부 병변의 KOH 표본에서 피부사상균을 직접 증명하고, 감염된 인설의 순수 배양물로부터 *M. canis*를 분리한 것에 근거를 두었다. 말과 사람에서 분리하고, PHOL 염색액으로 염색한 *M. canis*는 현미경으로 자세히 관찰했을 때 형태학적인 차이를 나타내지 않았다. 말에 있어서 옥도정기와 사람에 있어서 miconazole에 의한 국소 요법은 효과적이었다. 병력은 관리인이 말로부터 감염된 것을 제시하였다.

Key words : *Microsporum canis*, horse, dermatophyte, ringworm

Introduction

Dermatophytosis is one of commonly occurring disorders in animal as well as human medicine and is caused by a number of dermatophytic fungi[1,8,11,14,16]. In India, equine dermatophytosis is principally caused by *Microsporum gypseum*[4,13]. The available literature, however, failed to reveal any information on dermatitis in horses due to *M. canis* in India and also no record of its transmission to human beings[5]. The purpose of this paper is to delineate the zoonotic significance of *M. canis*.

Material and Methods

Skin scrapings and hairs collected aseptically from the actively growing cutaneous lesions of a 1-year-old male non-descript horse and its 25-year-old handler constituted the material for this study. The horse belonged to a person living to nearby area of Anand, Gujarat. A part of the specimen digested in 10% potassium hydroxide for 15~20 minutes was screened under light microscope for the fungal elements, if any. The remaining clinical material was streaked on to the duplicate plates and slants of nutrient agar, blood agar, Sabouraud agar with chloramphenicol (0.1 mg/ml) and actidione (0.5 mg/ml). All media were incubated at 25°C and 37°C, and examined daily for microbial growth. Recently discovered PHOL stain[10] was employed to study the microscopic morphology of the cultural isolates. The detailed identity of the isolates was made as per the criterion described by Rebell and Taplin[15] and Baxter and Rush-Munro[2].

Chemotherapy in horse was done with topical application of tincture of iodine solution (2%) on the ringworm lesions after the removal of crusts. Miconazole cream (2%) was applied on the tinea manuum of animal handler. This treatment was continued for

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three weeks. No mycological evaluation of the drugs was assessed.

Results

Physical examination of horse showed circular, slightly raised and crusty lesions on croup and flank region. The hairs were brittle and easily fall off leaving a bald patch on the skin. The animal handler had two scaly ringworm like lesions on the right hand. Many arthrospores and branched, septate, non-pigmented hyphae characteristic of dermatophytes were observed in the scales of the infected skin by potassium hydroxide technique. There was no evidence of *Prototheca*, yeast and ectoparasite in the clinical samples when examined in KOH mounts. The colony on Sabouraud dextrose agar with chloramphenicol and actidione grew as whitish, fluppy and reverse side of slant showed yellow colour. No other organisms could grow on other laboratory media. Hair perforation test indicated wedge shaped perforation in the hair. The cultures in PHOL stain revealed many thick-walled, multiseptate, spindle shaped macroconidia (Fig 1) and few microconidia. The isolates were identified as *M. canis* and no cultural and microscopic difference was observed in equine and human strains of *M. canis*. Topical application of drugs showed clinical response in both the patients within a week. No side effects such as erythema, urticaria or pruritus were noticed after the use of drugs.

Fig 1. Multiseptate, thick-walled, spindle shaped macroconidia of Microsporum canis isolated from cutaneous lesions of 1-year-old horse. PHOL stain ×600.

Discussion

M. canis is the principal dermatophyte isolated from cutaneous lesions from cats and dogs[6,9,16]. However, natural infection due to this zoophilic fungus is also recorded in bat, bear, carnary, cattle, chimpanzee, donkey, fox, gibbon, goat, gorilla, guinea pig, horse, jaguar, lion, lynx, monkey, pig, rabbit, sheep, tiger, zebu besides man[1,6,12]. The identification of *M. canis* in the cutaneous lesions of a young horse both by direct microscopy as well as cultlure established the causative significance of this zoophilic dermatophyte in equine dermatitis.

The public health implications of zoophilic dermatophytes are well documented in literature[1,3,6,7,12,16]. The close association with the infected horse resulted in the transmission of *M. canis* to man. Similar observation has been recorded by Pal and Matsusaka[12] where an animal atendant contracted *M. canis* infection from a diseased monkey.

No epidemiological investigation was conducted to establish the source of *M. canis* infection in this case. It is mentioned that cats and dogs serve as chief reservoir of *M. canis* and perhaps maintain the infection in endemic state. The owner did not keep any pet animal but his next door neighbour had one dog which may probably carrying *M. canis* on the skin. As *M. canis* is isolated from dogs in India, it is quite possible that the horse would have probably acquired the ringworm infection from the immediate surroundings. The role of dogs and cats as asymptomatic carrier of *M. canis* may be studied in India.

Conclusion

The ringworm infection in a young horse and its keeper due to *M. canis* has been described. The diagnosis in animal and man was based on the direct demonstration of dermatophytic fungi in cutaneous lesions by KOH method, and also by isolation of *M. canis* in pure growth from the infected scales. The detailed microscopic examination of equine and human isolates of *M. canis* in PHOL stain did not reveal any difference in their morphology. Local therapy with tincture of iodine in equine and miconazole

in man was effective. The case history revealed that handler contracted *M. canis* from the affected horse. The carriage of *M. canis* on the coats of dogs and cats in India and their role in the epidemiology of dermatophytosis should be studied.

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