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SOME STUDIES ON RINGWORM IN DONKEYS

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SUMMARY

During the period from February 1998 to January 2000; clinical and laboratory examination were carried out on 521 donkeys at different localities in Zagazig, Sharkia Governorate. Twenty-eight animals out of them were proved to be infected with ringworm. The lesions are characterized by circumscribed hairless areas of about 1-3 cm in diameter; lesions may be localized or generalized and distributed over the neck, shoulders, limbs and flanks with itching in some cases

High incidence of clinical cases were found in winter especially in young animals and in adult animals under stress..

Microsporum canis (*M.canis*), Trichophyton equinum (*T. equinum*) and Trichophyton verrucosum (*T.verrucosum*) were isolated and identified on the basis of characteristic microscopical examination of the hair and skin scraping and morphological appearance of the colonies on selected media.

The isolated *M.canis*, *T.equinum* and T.verrucosum were sensitive to griseofulvin and resistant to nystatin.

High efficiency of the local treatment and clinical improvement were observed when treatment with either Mycoderm, or Tr. iodin 2.5 % or garlic extract . Also systemic treatment with griseofulvin was highly effective in generalized infection in addition to supplementation of the diet particularly with vitamin A .

Dermatophytes could not be isolated from samples collected from treated animals at two weeks intervals and up to the eighth week post treatment . Control measures were applied through disinfection of the stables with a spray containing 2.0% formaldehyde and 1.0% caustic soda.

INTRODUCTION

Dermatophytes are moulds capable of parasitizing only keratinized epidermal structures; superficial

skin , hair and nails. Dermatophytes infections are commonly called ringworm (tinea). There are three related genera of filamentous fungi imperfect namely, *Trichophyton (24 species)*, Microsporum (16 species) and Epidermophyton (2 species).In animals, ringworm infections are due to species of *Trichphyton* or *Microsprum*; while the genus Epidermophyton is not represented. (Buxton & Fraser, 1977; Deacon, 1997 and Dwight et al., 1999). The disease is widespread through the world and it is of considerable zoonotic importance; Zoophilic dermatophytes primary infect animals, but they may be transmitted from animals to human (Refai, 1988; Dekio and Jidio, 1994).

The purpose of this study is directed to throw light on some aspects on ringworm in donkeys including the following:1-Limited survey on the prevalence of ringworm in donkeys. 2- Isolation and identification of the causative agents. 3- Sensitivity of the isolated fungi to some antimycotic drugs. and 4- Treatment trials .

MATERIAL AND METHODS

Animals:

521 donkeys of about 1-12 year old in different localities in Zagazig , Sharkia governorate were clinically examined according to Kelly (1984) , out of which 65 (12.48%) showed skin affections and were subjected to further investigations

Samples:

Hair and skin scrapings were collected from the edges of recent lesions of the 65 affected animals as well as from 13 contact animals for parasitological and mycological examinations. Each sample was divided into two parts. A part from each sample was prepared for microscopical examination according to Kelly (1984), the other part was cultured on Sabauroudís - dextrose agar media Two cultures were used for each sample; one was incubated at 30 °C and the other was incubated at 37°C for 6 weeks for mycological examination. The isolation and identification of dermatophytes were applied according to Quinn et al. (1994) and Fisher & Cook (1998) .

Twenty-eight donkeys proved to be infected with ringworm were classified into 4 groups and subjected to treatment trials. Moreover 5 out of 13 examined contact donkeys proved to be infected and were subjected to treatment (Group 5).

In vitro sensitivity test of the isolated fungi to each of griseofulvin and nystatin were carried out according to Lenhort (1969).

Treatment trials:

a- Topical treatment was applied in the early stages , where the lesions are small and few in number as follows : clipping of the hair was carried out , the crusts were removed by a brush and burnt and the medicament was rubbed vigorously on the lesion; either Tr. Iodine 2.5% or mycoderm* or garlic extract according to Amer et al. (1980) were topically applied twice daily on the

affected areas for 7-10 days.

b- Systemic treatment was used in the form of oral administration of gresiofulvin** 7.5 mg/kg body weight daily for 10 days given by drench.

*Mycoderm : A patent preparation , composed of : Iodine 1 gm , salycilic acid 1 gm, benzoic acid 2 gm , chlorpatonol 1 gm, alcohol 50 % add to 100 ml (Nile Company for Drugs and Chemical industries , Egypt.)

Gresiofulvin**: Ultra Gresiofulvin tablet; each tablet contains 125 mg gresiofulvin ultramicronized. (Kahira Pharm. & Chem. Ind. Co. Cairo, Egypt.)

c- Supplementation of the diet with some feed additive (vitamins and minerals) especially vitamin A at a dose rate of 1 gram per each kilogram ration. The stables were disinfected with a spray containing 2 % formaldehyde and 1 % caustic soda.

During and after treatment period; animals were clinically examined, hair samples were examined microscopically and mycologically every two weeks and up to the eighth weeks post treatment.

RESULTS

Clinical examination of 521 donkeys revealed that 65 (12.48 %) out of them were suffering from skin affections. Microscopical and mycological examinations of the hair and skin scraping from affected and apparently normal animals revealed that 28 donkeys proved to be infected with ringworm (5.37%), they showed circumscribed hairless areas of about 1-3 cm or more in diameter; distributed over the head, neck, shoulder and limbs (Figs. 1,2 ,3 and 4) .

The higher incidence of infection was in young animals (up to 2 years old) were noticed especially during winter months; also outbreaks among adult animals (more than 3 years) occurred during different seasons after transportation and exposed to malnutrition.

M.canis, *T.equinum* and *T.verrucosum* were isolated and identified from both infected and apparently normal contact donkeys.

M.canis was isolated from 12 cases where dogs were in contact. The results of clinical, microscopical and cultural examinations in relation to age and season of infection are shown in Table (1).

Results of sensitivity test showed that griseofulvin at a concentration of 20 µg/ ml media or more inhibited the growth of both M.canis, *T.equinum* and T.verrucosum, while nystatin at different con-

centrations had no effect on the growth of fungi.

The local treatment was highly effective with clinical improvement and recovery that were observed on treated animals; mycoderm (7-10 days), garlic extract (7-15 days) and Tr. iodin 2.5 % (10-15 days). Systemic treatment with griseofulvin in generalized infection and apparently normal animals (10-35 days)was also effective. (Table 2) .

Drmatophytes could not be isolated from samples collected from treated animals every two weeks and up to the eighth week post treatment.

DISCUSSION

Ringworm is normally considered to be a condition of housed animals due to more frequent contact between animals (Ainsworth and Austwick, 1973). This affection is characterized by local dermatitis of about 3 cm in diameter or more with

Table (1) : Results of clinical, microscopical and mycological examinations.

Age of animal	No.of animals	No.of Clinically Infected			No.of Positivesamples				Isolatedstrains.		
		Local	general	Total	Infected		Healthy		M.canis	T.equinum	Tr.verru coseum
					ME		ME	CE			
Young	153	13	5	18	18	10	4	2	7	3	2
Adults	368	7	3	10	10	7	1	1	5	2	1
Total	521	20	8	28	28	17	5	3	12	5	3

ME: Microscopical examination. CE: Cultural examination.

Table (2) : Results of treatment trials of infected donkeys with different drugs.

Group No.	Condition	No.	Drug used	Application	Complete recovery after
1st	Local infection	7	Garlic extract	Local	7-15 days
2nd	Local infection	7	Tr.iodin	Local	10-15 days
3rd	Local infection	6	Mycoderm	Local	7-10 days
4th	General infection	8	Griseofulvin	Orally	17-35 days
5th	Apparently healthy	5	Griseofulvin	Orally	10-25 days.

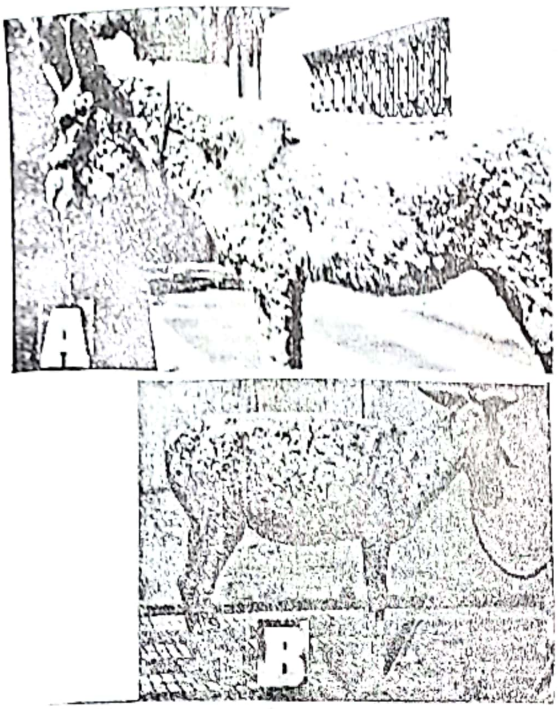

Fig.(1) : A- A donkey with generalized infection

B- The same case 17 days post treatment

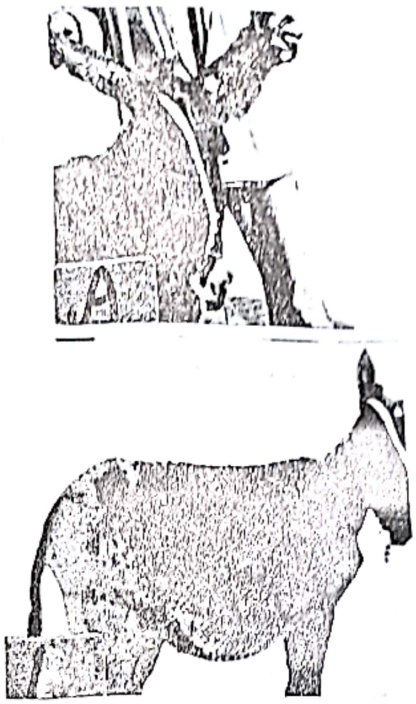

Fig.(2) :A- Localized infection in ear.

B- Localized infection in the thigh

Fig.(3) : A- A donkey : generalized lesions before treatment.

B- The same case; 10 days post treatment.

Fig (4): A- The same case; 15 days post treatment

B- The same case; 22 days post treatment

C- The same case; 35 days post treatment

partial loss of hair, subsequently an asbestos like crusts and the area becomes markedly gray in colour. These crusty lesions are strongly adherent to the underlying tissue.Mycological examination revealed that *M.canis,T.equinum* and *T.verrucosum* were isolated and identified.This finding agrees with Koplan et al. (1957) who concluded that M.canis was the most important caussative agent of dermatomycosis in horses followed by Tr.verrucosum and M. gypseum. Buxton and Fraser (1977) described ringworm lesions in horses as alopecia, epithelial desquamation and crust formation and may be accompanied by severe itching. The lesions developed initially on the trunk , croup and later on spread on the neck, head and limbs. Ali et al. (1981) in Sudan isolated T. mentagrophytes from severe outbreak of pruritic ringworm among 69 adult riding donkeys. Mohamed (1988) reported that ringworm in ponies which showed alopecia, crusts formation which adhered firmly to the skin lesions that were frequently located over the saddle grith areas, the neck, the back and the rump, Abd-Elsalam et al. (1993) isolated M.canis from 8 donkeys showing clinical symptoms of ringworm. Uenbelt and Pascoe (1994) described ringworm in horses cused by Tr verrucosum,Tr.equinum and M.gyypseum. El-Kot (1996) examined clinically 130 donkeys showing skin affection and identified M.gypseumin from 86 animals and Keratinomyces ajelloe from 34 animals. Shimozawa et al. (1997) examined 87 racehorses suffered from infectious dermatitis. They isolated T. equinum from 26 cases (29.9%) and M. equinum from 3 cases (3.4%). Dwight et al. (1999) enlisted *T.equinum, M. canis ,M. gypseum* and *T. mentagrophytes* as dermatophytes infection in horses .

M.canis was isolated in this study from 12 cases where dogs were in association. This result agrees with that of Korting and Zienike (1990) who recorded that T.verrucosum, M. canis that a quire from cattle , dogs and cats were responsible for dermatitis in horses.

The obtained results indicated that higher infection rate was among young animals and during winter months While outbreaks in adult animals were reported during different seasons and appeared after transportation and exposure to malnutrition associated with bad hygiene, these findings are supported by El-Ghareib and Khadr (2000) who identified ringworm in 6 (3.9%) out of 153 horses, five of them were young foals and one case was observed in 13 years old mare. Radostits et al. (2000) reported that high incidence of clinical cases of ringworm occur in the winter season, however, outbreaks also occur during the summer months so that close confinement and possibly nutrition seem to be more important in the spread of the disease than other environmental factors such as temperature and sun light.

Humidity is known to be important, a high humidity being conductive to multiplication of the fungus. Animal susceptibility is determined largely by immunological status of animal, so that young animals are more susceptible.

In this study the *M.canis,T.equinum* and T.verrucosum were islolated from apprantly healthy contact donkeys. This finding agrees with Jaksch (1963) who identified *Tr. mentagrophytes, Tr. Verrucosum* and *M. canis* from horses with and without skin diseases El-Bahay and Refai (1973) and Pascoe and Connole (1974) isolated M.gypseum from the skin of apparantelly healthy horses Kamel et al. (1976) in Egypt isolated M.gypseum from apparantly healthy equine. Abou- Eisha and El-Attar (1994) found that many domestic and wild animals carry dermatophyte spores on their coats without any signs of disease. El-Kot (1996) identified 3 M.gyseum isolates from 15 apparantly healthy donkey .Recently Radostits et al. (2000) concluded that spores can exist on the skin without causing lesions and up to 20% of normal animals in an infected group will act as carriers .

In vitro, sensitivity test showed that *M.canis, T. equinum and T.verrucosum* isolates were highly sensitive to griseofulvin and resistant to nystatin, similar results were reported by El Timawy et al. (1988).

Treatment trials revealed that local application of Mycoderm showed curative effect 7-10 days. This agreed with Torky and Hammad (1981) who concluded that the most effective application tested on the camel lesions infected with Tr. verrucosum and *Tr. gypseum* was benzoic acid followed by iodine.

Treatment with garlic juice showed complete healing 7-15 days post treatment, result which indicated that garlic extract had an inhibitory effect against various dermatophytes This finding concids with that obtained by Amer et al. (1980) and Abdel Naby (1985), El-Sadek et al . (1988); Abdel-Samee (1993) and Sharma et al. (1994) and agree to a certain extent with those reported by El-Ghareib and Khadr (2000) and disagrees with El-Sherif et al. (1981) who recorded that topical treatment of trichophytosis in buffalo calves with garlic juice was not very effective.

Tr. iodine gave good results after 10-15 days, similar results were reported by El-Kot (1996) who treated donkeys with topical application of Tr. iodin for 12 days; hair regrowth and healing of lesions were noticed on the sixth day of treatment and complete recovery was observed on the tenth day. While El-Sayyad et al. (1991) indicated that animals treated with tincture iodine required more than 3 weeks (nearly 6 weeks) for recovery.

The variation in healing period in local treatment depends on the frequency of application and the concentration used or the immunity required by the animal, (Amer et al., 1980).

Systemic treatment with oral administration of griseofulvin 7.5 mg/kg body weight daily for 10-12 days revealed good response. hair regrowth and healing of lesions were observed at the 17-25 days post treatment and complete recovery was observed at 32-35 days. El-Kot (1996) treated donkeys with gresiofulvine 7.5 mg / kg B wt for 12 days; hair regrowth and healing of lesions were noticed at the sixth day of treatment and complete recovery was observed on the tenth day.

Disinfection of the buildings by spraying with 1% caustic soda and 2% formalin solution twice with one week interval beside treatment of infected animals and supplimentation of the diet with vitamin A controlled these cases, a finding which agrees with that of Radostits et al. (2000) who concluded that although ringworm occurs in well nourished as well as poorly fed animals which. become infected more readily and develop more extensive lesions. Supplementation of the diet, especially with vitamin A to housed animals is encouraged as is assist in prevention of infection and in recovery.

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