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CRYPTOSPORIDIAL INFECTION IN MAN AND FARM ANIMALS IN ISMAILIA GOVERNORATE

BY

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SUMMARY

In a survey for cryptosporidial infection among farm animals in Ismailia Bovernorate, Cryptosporidum sp. oocysts were found in 94 (11.2%) out of 836 faecal samples of different farm animal species. The cryptosporidial infection was more prevalent in young farm animals (Age ≤ 1month); 13.3% of buffalo-calves, 24% of lambs, 21.3% of kids and 25% of calf-camels. It was significantly higher in young farm animals had diarrhoea than non diarrhoeic ones. In adult farm animals (dams), low cryptosporidial infection rate was found in ewes (2.4%) and goats (3.3%). Cryptosporidial sp. oocysts were not observed in faecal samples taken from buffalo-cows, and clinically normal horses and she-camels.

On the other hand, Cryptosporidium sp. oocysts were found in 3 (5.4%) out of 56 persons who had a history of contact with farm animals. The percentage of cryptopsoridium positive cases was significantly higher among persons who were in contact with calves than those in close contact with other farm animals. This provides epidemiological support for the confirmation that cryptosporidiosis a zoonosis.

INTRODUCTION

Cryptosporidiosis is an increasingly recognized important coccidial disease of man and domestic animals and is a life-threatening disease of immunodeficient hosts (Tzipori 1983, Current, 1984 and fayer and Ungar, 1986). In cattle, cryptosporidium was first recognized in an eight-month-old heifer in the U. S. A. (**Panciera,** et. al., 1971), since it has been found in a number of occasions in calves up to 3 weeks old (Meuten, et. al., 1974, Morin, et. al., 1976 Pearson and Logan, 1979 and Snodgrass, et. al., 1980).

Two outbreaks of enteritis attributed to cryptosporidiosis have been reported in lambs (Tzipori, et. al., 1981 and Angus, et. al., 1982). Cryptosporidium was detected in a dead goat kid with diarrhea (Mason, et. al., 1981). Cryptosporidiosis in horses regarded as of a rare occurrence (Synder, et. al., 1978) and it had been reported only in immunodeficient Arabian foals. However, one survey demonstrated antibodies to cryptosporidium species in 19 of 22 scottish horses (Tzipori and Campbell, 1981).

The first case of human cryptosporidiosis was reported in 1976 (Nime, et. al., 1976) . The infection could be an important cause of mild to severe transient diarrhoea in immunologically normal patients. Domestic animals have been suspected as likely reservoirs for cryptosporidium capable of infecting humans (Tzipori, 1983). This work was carried out to throw light on the prevalence of cryptosporidiosis among farm animals and its zoonotic importance in Ismailia Governorate.

MATERIAL AND METHODS

Eight hundred - thirty six fecal specimens were collected from different farm animal species, 525 buffaloes (375 calves and 150 cows), 183 sheep (100 lambs and 83 ewes), 105 goats (75 kids and

30 goats), 8 horses (2 foals and 6 mares) and 15 camels (4 calf-camels and 11 she-camels), in areas of Ismailia Governorate where farm animal production is concentrated. The age of farm animals were estimated by examining their teeth and by using the registered report in the animal farm. Only one of the examined farms (The faculty of vet. Medicine farm) has horses and camels in addition to the other previously mentioned animal species. Faecal specimens were collected by using rectal swabs from the examined farm animals, because these animals were in groups and therefore, it was the only way to obtained individual specimens.

On the other hand, 56 human fecal specimens collected from persons (Age, 15-50 years) who were in close proximity to the calves (9) and other farm animals (47).

The collected faecal specimens were placed in snap-capped vials. Each specimen was labeled to indicate the date, age, place of collection and whether the animal had diarrhea or not.

MICROSCOPICAL EXAMINATION

Faecal samples were processed by sugar flotation within a few hours of collection (Anderson, 1981), in the Faculty of veterinary Medicine, Suez Canal Unviersity. One drop of fluid from the levitation suspension (meniscus) was deposited on a glass slide, coverglassed and examined microscopically at 400 x. The levitation suspension was also examined for the detection of cryptosporidium oocysts by Iodine wet mount (Ma and Soave, 1983) as confirmatory test, in which the oocysts are shown as unstained, colorless structures, while the yeast and other fecal contents are stained brown with iodine.

A x^2 test independence was used in the analysis of the results.

RESULTS

Table (I): Number of different farm animals positive for Cryptosporidium spp. infection by age and association with diarrhea and without diarrhea.

Animal species	Total No. of examined animals	Age	Number of specimens containing Cryptosporidium sp. oocysts / number of specimens examined.		
			Overall %	animals had no diarrhoea %	animals bad diarrhea %
Buffaloes					
-Calves	375	≤ 1 month	50/375 (13.3)	35/334 (10.5)	15/41 (36.6)
-Cows	150	≥ 3 years	0/150 (0)	0/140 (0)	0/10 (0)
Sheep					
-Lambs	100	≤ 1 month	24/100 (24)	9/74(12.2)	15/26 (57.7)
-Ewes	83	≥ 2 years	2/83 (2.4)	1/64 (1.6)	1/19 (5.3)
Goats					
- Kids	75	≤ 1 month	16/75 (21.3)	11/64 (17.2)	5/11 (45.5)
-Goats	30	≥ 2 years	1/30 (3.3)	1/27 (3.7)	0/3 (0)
Horses					
-Foals	2	≤ 1 month	0/2 (0)	0/2 (0)	--
-Mares	6	≥ 5 years	0/6 (0)	0/6 (0)	--
Camels					
-Calf-camels	4	≥ 1 month	1/4 (25)	0/2 (0)	1/2 (50)
-She-camesl	11	≥ 5 years	0/11 (0)	0/11 (0)	--
	836		94/836 (11.2)	57/724 (7.9)	37/112 (33.04)

Difference in cryptosporidium infection rate between the examined young farm animals had diarrhoea and had not was significant.

- Buffalo-calves. $X^2 = 21.3$ ($P < .001$)
- Lambs $X^2 = 22.2$ ($P < .001$).
- Kids $X^2 = 4.6$ ($P < .05$)

Prevalence of cryptosporidium infection in farm animals, buffaloes, sheep, goats, horse and camels summarized in table (1). Cryptosporidum sp. oocysts were found in 94 (11.2%) of 836 faecal samples from different farm animal species screened. Young farm animals (Age ≤ 1 month) appear to be the most heavily infected with Cryptosporidium sp. It found that 50 (13.3%) out of 375 buffalo-calves, 24 (24%) out of 100 lambs, 16(21.3%) out of 75 kids and, 1 (25%) out of 4 calf-camels had Cryptosporidium sp. oocysts.

Cryptosporidium infection rates were significantly higher in young animals had diarrhoea (36.6% in buffalo-calves, 57.7% in lambs, 45.5% in kids and 50% in calf-camels) than the others had no diarrhoea (10.5%, 12.2% 17.2%, 0% in buffalo-calves, lambs, kids and calf-camels respectively.) .

Low cryptosporidium infection rate was found among the examined adult farm animal species (dams); 2 (2.4%) out of 83 ewes, and 1 (3.3%) out of 30 goats. Cryptosporidium sp. oocysts were not observed in the feces of the examined buffalo-cows and clinically normal horses and she-camels. There was no significant difference between cryptosporidium infection rate in dams had diarrhoea and hadn't (P > .05).

In humans, Cryptosporidium sp. oocysts were found in 3 (5.4%) of 56 farmers (Table 2). The percentage of cryptosporidium infection in persons had contact with calves (22.1) was significantly higher than those in close contact with other farm animals (2.1), (P > .05).

DISCUSSION

Scant information is available on the prevalence of cryptosporidial infection, but based on cases reported, cryptosporidiosis will likely prove to be common in a variety of animals and man (Reese, et. a., 1982 and Kirkpatrick and Farrell, 1984). In this study, 11.2% of examined farm animals harboured cryptosporidium species, and the infection was more prevalent in young farm animal species (Age ≤ 1 month). This was in agreement with that observed by Pohlenz, et. al., 1978; Anderson and Bulgin, 1981, Kirkpatrick and Farrell, 1984 and Desokey, et al., 1989 Cryptosporidium infection rate was significantly higher in young farm animals had diarrhoea than those had not (Angus, et. al., 1982 and Sobieh, et. al., 1987). It is deduced that clinical cryptosporidiosis in likely apt to occur in very young animals, particularly young ruminants and there is a close association between host age and susceptablility to infections (Snodgrass, et. al., 1980, Tzipori, et. al., 1982, Mohamed, 1986 and Simpon, 1992).

Table (2): Cryptosporidial infection among people who were in close proximity to the examined farm animals

Total number	Age	Number of fecal specimens containing Cryptosporidium sp. oocysts /number of specimens examined.		
		Overall %	persons in contact with calves %	persons in contact with other farm animals %
56	15-50 years	3/56 (5.4)	2/9 (22.1)	1/47 (2.1)

$X^2 = 5.8$ (P < .05)

Cryptosporidium sp. oocysts were found in diarrheic calf-camel (25%), but its not found in non-diarrhoeic calf-camels and she camels which were clinically normal. This is the first report to describe cryptosporidiosis in camels. It is obviously that cryptosporidium oocysts can be shed by any species of domestic animals infected by cryptosporidium (Fayer and Ungar, 1986).

In adult farm animals (dams), there was a low cryptosporidial infection rate among ewes and goats. Cryptosoporidium oocysts were not observed in faecal samples taken from buffalo-cows, and clinically normal she-camels and horses which were found in one of the examined farms where cryptosporidiosis of other young animals was prevalent . This was nearly similar to that reported by Synder, et. al., 1978 and Reinemeyer, et. al., 1984. Anderson, 1982, reported that cryptosporidium oocysts were not observed in over 1600 fecal samples taken from clinically normal adult cows in farms where cryptosporidiosis of young calves was highly prevalent. However, it seems likely that transmission of the infection is from the dams and because of the demonstrated broad host range of the parasite (Tzipori, 1983), the possibility of transmission from stray dogs, cats and rodents can not be disregarded.

This survey showd a significant differences in the Cryptosporidium sp. infection rate among the different farm animals but did not permit a positive identifiation of the factors influencing the prevalence of the disease. However, the results suggested that the prevalence of infection was influenced more by management than by environment, since a higher prevalence of infection was recorded in farms had a high stocking rate of animals and under more intensive system of management when compared with other farm animals (Anderson and Hall, 1983).

On the other hand, in the present investigation, Cryptosporidium sp. oocysts were found in persons who had a history of contact with farm animals (5.4%). This is in agreement with that reported by Tzipori, et. al., 1980, and Current and Reese, 1982. The percentage of cryptosporidium positive cases was significant higher among persons who were in contact with claves than those in close contact with other farm animals ($P < .05$). The cryptosporidium sp. oocysts of human isolate were morphologically indistiguishable from those obtained from infected farm animals (Reese, et. al., 1982). This adds support to the proposal that cryptospordiosis should be regarded as a potential zoonosis and that species of cryptosporidium may not be host specific (Tzipori., et. al., 1980 and Desokey et. al., 1989).

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