Some associated factors with Cryptosporidium infection in lambs and dogs

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Abstract

The use of MZN technique revealed the detection of Cryptosporidiur spp. Oocysts in 26 out of 254 (10.24%) fecal samples collected fror diarrheic and apparently healthy calves in Behera and Menoufi governorates. There were significant associations between infection c calves with Cryptosporiduim spp. and their age and health status. O the other hand, there were no significant association between infectio of calves and their sex and season of the year.

By using MZN technique, Cryptosoridium spp. Oocysts have bee detected in 31 (12.4%) out of 250 lamb samples in both governorates. I studying the relation between infection with Cryptosporidium and th age of lambs, the relation was significant; denoting that the age of lamb is an important factor in susceptibility to infection. By the use of MZI technique, Cryptosporidium oocysts have been detected in 2 (3.84% out of 52 clinically healthy dogs in Behera governorate. The positiv MZN samples were retested by using ELISA. The sensitivity of the tes was clear as 25 (96%) out of 26 calf samples; 29 (94%) out 31 of lam samples and 2 (100%) out of 2 dog samples were positives with ELISA The overall sensitivity of the commercially available ELISA was (96.6% for all samples.

Introduction:

Cryptosporidium is an enteric coccidian parasite that causes diarrhea range of vertebrates worldwide. Cryptosporidium infection of livestock may important economic impact to farmers because of high morbidity and somet mortality rates among farm animals (Casmore et al., 1997). Recently, the c cryptosporidiosis was changed from that of rare and largely asymptomatic ir an important cause of diarrhea in calves, lambs and also it is an important diarrhea and enterocolitis in human beings especially in immunocompromise and children and in groups involved in cryptosporidiosis is widely considere disease of neonates, however sub clinical infection have been reported in olc and less frequently in adult animals (Nouri and Toroghi, 1991).

Bovine occur either alone or together with other enteric pathogens bacterial or viral (Bjorkman et al., 2003). The ileum always harbors the r developmental stages of the parasite, some of these stages could be fou enterocytes of the duodenum, jejunum, caecum and colon (Current and Ree

A significant relationship was found between C. parvum infection and the age (De La Fuente et al., 1999). Atwill et al. (1999) and O'Handley et al., (1999) that Cryptosporidium parvum shedding in dairy calves occurring at 8-14 days Calves that infected with C. parvum had a significantly higher rate of diarrhea infected calves (Uga et al., 2000). Calf to calf contact appeared to be the m source of transmission. Cryptosporidium oocysts excreted with feces of infec animals, particularly calves can be a source of human infection having influence on public health (Mirion et al., 1991 and O' Handley et at., 1999).

In contrast, there is a less information on the occurrence of cryptosporidiosis i The infection often causes death of diarrheic lambs and the intensity of infec higher in lambs than in sheep (Olseon et al., 1997 and Viera et al., 1 presence of C. parvum oocysts in feces of apparently healthy dogs help in ma the environmental contamination and provide infection for the other su animals and human beings (Ederli et al., 2005).

Materials and methods

This study was carried out in some rural areas of Behera and governorates throughout a period of one year. A total of 254 fecal samp collected from diarrheic (150) and apparently healthy (104) calves ranging b day- 3 months in age. Moreover, 250 fecal samples were collected from diar apparently healthy lambs (1 day – 3 months old) in the same areas. In ad fecal samples were collected from clinically healthy dogs ranging in age from – 2 years old) in Behera governorate only. All the collected samples were ide the locality, sex, age, health state and character of fecal matter of the anim laboratory, 1 g of each fecal sample was emulsified in 10% formalin sol preserved until performing MZN technique, then approximately 5 g of e sample was mixed with 2.5% potassium dichromate solution and kept at detection of Cryptosporidium parvum by ELISA.

Modified Ziel-Neelson staining:

Cryptosoridium spp. Oocysts were stained with modified Ziel-Neelson examined microscopically according to (Henrikson and Pohlenz, 1981).

ELISA:

ELISA was performed for detection and confirmation of the MZN positive using (RIDIASCREEN test C-1201 GmbH, Darmstadt, Germany) according et al., 1990).

Statistical analysis was done using Chi-square test "X2" according to (Hill, 197

Results and Discussion:

Cryptosporidium parvum is a ubiquitous coccidian parasite that cause di many mammalian species. It is the second most common pathogen from your with diarrhea (Hall et al., 1992).

Table (1) showed that the incidence of Cryptosporidium parvum in faecal from calves as examined by MZN staining was 26 (10.24%). Among the samples 25 (9.83%) were confirmed by using ELISA. Bogaaerts et al. (1987) al. (2000) and Isaacs et al. (1985) stated that MZN staining technique has bee used as a reliable method for detection of Cryptosporidium spp. oocysts samples since it allows the observation of C. parvum oocysts at lower mag power and solves the problem of differential diagnosis related to the pres yeasts. Higher detection rates were recorded by Abo-El-Magd and Haiba (19 demonstrated the parasite in the faeces of 185 out of 246 clinical diarrheic l calves (1-5 weeks old) at two different localities (Quena and Naga-Hamadi).

Furthermore, the 26 MZN (+ve) samples were retested and confi Ridascreen Cryptosporidium (an enzyme linked immunoassay for dete Cryptosporidium). Out of 26 MZN (+ve) samples, 25 samples were (+ve) b Different workers compared the sensitivity and specificity of ELISA to the mic detection of Cryptosporidium oocysts in faecal samples. McClusky et al indicated a moderate agreement between the two diagnostic methods, wit being the more sensitive of the two. Majewska et al. (2000) showed that both showed the same sensitivity. Moreover, Sreter and Varga (2000) and Marqu (2003) stated that the sensitivity and specificity of some ELISA tests render good tool in serology based epidemiological investigations or scree environmental samples. Table (2) showed that a nearly similar number of sam collected from both Governorates (Behera and Menoufia) and the incidence ra nearly the same. Out of 128 and 126 faecal samples collected from calves a and Menoufia Governorates, 14 (10.94%) and 12 (9.52%), respectively tested C. parvum oocysts.

The association between C. parvum infection and age of the examined cal demonstrated in table (3) and Fig. (1). A total of 254 calves were grouped acc their age during the course of the study into three age groups: 132 calves (<1 59 (1-2 month) and 63 (2-3 month). C. parvum oocysts were detected in 20 (3 (5.08%) and 3 (4.76%) of the examined calf groups respectively with incidence rate being in the 1st age group (<1 month of age). The Chi square va was 7.2339*. In cattle, clinical infections seems largely confined to new born 7-21 days of age (Garber et al., 1994). The prepatent period of 5-12 days fol oocyst shedding which is usually coincident with the onset of diarrhea. The results agreed with those of Ares-Mazas et al. (1999) who examined faecal

from 101 bovine calves in a farm in northern Spain. They detected that 26% c were infected and the incidence of infection was 81% in age group I (2-36 da in age group II (1.5-4.5 month) and 0 in age group III (20-24 month). This pr infection occurred early in the neonatal period and the environment wa contaminated with oocysts. Initial exposure to infective oocysts appears to oc maternity pen or shortly after placement in outdoor cages. However the ro apparently healthy carriers in the epidemiology of the disease has more described. Excretion of oocysts has been found in apparently healthy ac (Villacorta et al., 1991 and Scott et al., 1994).

Out of 150 diarrheic calves, 21 (14%) excreted C. parvum oocyst faeces, while out of 104 apparently healthy calves, only 5 (4.8%) excreted C oocysts in their feces (table 4 and figure 2). Statistical analysis of thes revealed that there was a significant association between infection with C. pa presence of diarrhea in calves ($P < 0.05$) denoting that C. parvum is an import in calf diarrhea. Hall et al. (1992) stated that C. Parvum is the second pathogen from young calves with diarrhea. The obtained results in the pres were in agreement with those of Naciri et al. (1999) who recorded the prese parvum oocysts in the feces of diarrheic suckling and dairy calves in Fran percentages of 34.7 and 2.4, respectively, while C. parvum were detected ir non diarrheic suckling and dairy calves at a percentages of 13.8 and 3.9, res Furthermore, Uga et al. (2000) reported that calves infected with Crypto parvum had a significant higher rate of diarrhea (33%) than non infected ca ($P<0.05$) suggesting that C. parvum infection was likely the cause.

The incidence of C. parvum infection in calves were, 5 (10%); 8 (10.34%) and 7 (7.29%) during winter, spring, summer and autumn respectively (table 5). Statistical analysis of these results revealed in association ($P>0.05$) between infection with C. parvum in calves and seas year in the two investigated Governorates. These results agreed with those by Wade et al. (2000) and Becher et al. (2004) who reported that ther significant association between the parasite occurrence and season. On hand, Mann et al. (1986) and Sahal et al. (2005) in Turkey recorded occurrence of the disease was more common in winter (56.4%) than du season (autumn 0%, summer 15.4% and spring 28.2%).

Among 250 faecal samples collected from lambs, the protozoan ooc detected in 31 (12.4%) of the examined samples as examined by MZN techr 31 (+ve) faecal samples were further tested using ELISA which revealed de Cryptosporidial antigens at a percentage of 29 (11.6%). Nearly similar re obtained by Majewska et al. (2000) who detected 16 (10.1%) out of 159 different ages by using MZN staining technique and ELISA.

Out of 127 and 123 faecal samples from lambs in Behera and Governorates, 15 (11.81%) and 16 (13%), respectively were positive Cryptosporidial oocysts. There was no significant difference in the detec between both Governorates (table 7). The examined lambs were categori age groups 107 (< 1 month of age); 80 (<2 month of age) and 63 (< 3 mont Cryptosporidial oocyst were detected in the faeces of the examined age gro incidence rates of 21 (19.63%); 7 (8.75%) and 3 (4.76%), respectively (table results agreed with those of Olson et al. (1997) in Canada, Majewaska et al. West-Central region of Poland and Noordeen et al. (2000) in SirLanka. Th work indicated that there was a highly significant association between infecti parvum and the age of lambs. Concerning the association between infectio parvum and sex of the examined lambs, table (13) showed that there significant association between sex of lambs and infection with the protozoan.

The incidence of Cryptosporidium Parvum Infection in feacal samples from examined by MZN staining technique and confirmed by ELISA was show (11). By the use of MZN staining technique, Cryptosporidium spp. oocysts h detected in 2 (3.84%) out of 52 clinically healthy dogs from Behera Governo results reported in the present study are in agreement with Huber et al. (2 reported a prevalence of 2.41% among clinically healthy dogs living in two (animal shelters and household pets) in Brazil. The presence of C. parvum faecal samples from apparently healthy dogs from Behera Governorate maintaining of the environmental contamination and provide infection for susceptible animals and human beings.

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Table [1]: Incidence of Cryptosporidium Parvum Infection in feacal samp calves as examined by MZN staining technique and confirmed b

Test	+ve cases		-ve cases		Total	
	No	%	No.	%	No.	%
MZN	26	10.24%	228	89.76%	254	100%
ELISA	25	9.83%	1	3.8%	26	100%

Table [2]: The association between the infection with C. parvum and lo of the examined calves.

locality	n =	+ ve cases		- ve cases	
		No.	%	No.	%
Behera governorate	128	14	10.94%	114	89.06%
Menoufia governorate	126	12	9.52%	114	91.48%
Chi sq. value $X^2 = 0.58$				P > 0.05	

Table [3]: The association between infection with C. parvum and age of the examined calves.

Age group	n =254	+ve cases		-ve cases	
		No.	%	No.	%
1st age group (<1 month)	132	20	15.15 %	112	84.85
2nd age group (<2month)	59	3	5.08%	56	94.92
3rd age group (<3month)	63	3	4.76%	60	95.24
Chi sq. value $X^2 = 7.2339^*$				P < 0.05	

Table [4]: The association between infection with C. parvum and health status of the examined calves.

Health status	n =254	+ ve cases		- ve cases	
		No.	%	No.	%
Diarrheic calves	150	21	14%	129	86%
Non-diarrheic calves	104	5	4.8%	99	95.2%
Chi sq. value $X^2 = 5.647^*$				P < 0.05	

Table [5] the association between infection with C. Parvum and sex of the examined calves.

Sex	n =	+ ve cases		- ve cases	
		No.	%	No.	%
Samples with ♂ sex.	138	14	10.14%	124	89.86%
Samples with ♀ sex.	116	12	10.34%	104	89.66%
Chi sq. value $X^2 = 0.001$				P > 0.05	

Table [6] The association between infection with C. Parvum in calves and season of the year.

season	n =	+ve cases		-ve cases	
		No.	%	No.	%
winter	50	5	10%	45	90%
spring	50	8	16%	42	84%
summer	58	6	10.34%	52	89.46%
autumn	96	7	7.29%	89	92.71%
Chi sq. value X^2 = 2.81				P > 0.05	

Table (7) Incidence of Cryptosporidium Parvum Infection in feacal sampl lambs as examined by MZN staining technique and confirmed by ELI

Test	+ve cases		-ve cases		Total	
	No.	%	No.	%	No.	%
MZN	31	12.4%	219	87.6%	250	100
ELISA	29	11.6%	2	6.45%	31	100

Table [8] The association between the infection with C. parvum and loca the examined lambs.

locality	n =	+ ve cases		- ve cases	
		No.	%	No.	%
Behera governorate	127	15	11.81%	112	88.19%
Menoufia governorate	123	16	13%	107	87%
Chi sq. value X^2 = 0.023				P > 0.05	

Table [9] The association between the infection with C. parvum and the the examined lambs.

Age group	n =	+ve cases		-ve cases	
		No.	%	No.	%
1st age group (<1 month)	107	21	19.63 %	86	80.37
2nd age group (<2month)	80	7	8.75%	73	91.25
3rd age group (<3month)	63	3	4.76%	60	95.24
Chi sq. value X^2 = 9.5 **				P < 0.05	

Table [10] The association between the infection with C. parvum and of the examined lambs.

Sex	n =	+ ve cases		- ve cases	
		No.	%	No.	%
♂ Samples.	121	14	11.57%	107	88.43
♀Samples.	129	17	13.17%	112	86.83
Chi sq. value $X^2 = 0.148$				P > 0.05	

Table (11) Incidence of Cryptosporidium Parvum Infection in feacal sa from dogs as examined by MZN staining technique and confirmed by

Test	+ve cases		-ve cases		Total	
	No.	%	No.	%	No.	%
MZN	2	3.84%	50	96.16%	52	100
ELISA	2	3.84%	0	0 %	2	100

Fig. [1]: The association between infection with C. parvum and age examined calves.

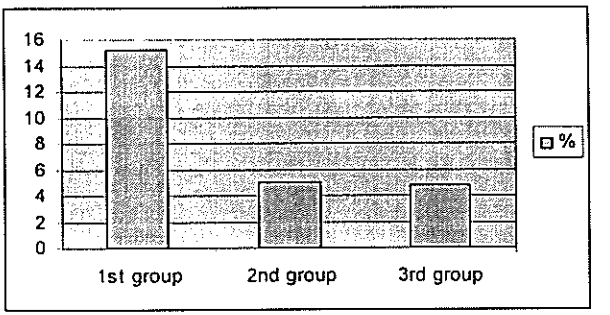

Fig. [2]: The association between infection with C. parvum and health the examined calves.

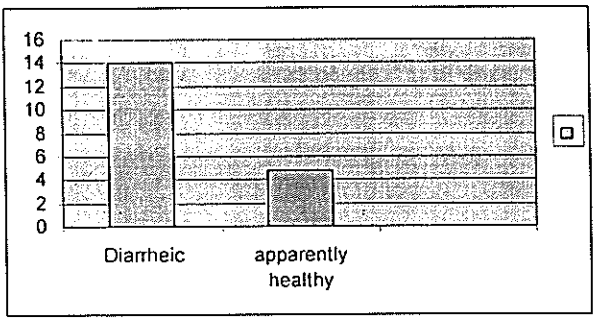

Fig. [3]: The association between the infection with C. parvum and the ag
examined lambs.