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CRYPTOSPORIDIOSIS IN CALVES WITH CHRONIC NON-RESPONSIVE DIARRHOEA

G.S.A.RIDHA

Department of Internal and Preventive Veterinary Medicine, College of Veterinary Medicine, University of Baghdad, Baghdad,Iraq

Summary

This research work was conducted to study the role of cryptosporidial infection in calves with chronic non-responsive diarrhoea (1-4 weeks old). The study shows that cryptoridium was common infections agent causing diarrhoea in calves during the first month of calf life.

The prevalence of cryptosporidiosis in calves with chronic diarrhoea was 51.5%, using the method of safranin methylene blue staining of faecal smears from diarrhoeic calves. The infection rate was higher in calves of group A (closed breeding system) than those of calves in group B (open breeding system) , as the study reveals the rate 65.6% and 42.3% respectively . The study also shows that infection was higher in calves of two weeks old (36.3%) than other age groups. cryptosporidium oocysts were also reported from few numbers of healthy non-diarrhoeic calves at rate of 8.1%.

INTRODUCTION

Cryptosporium (protozoa) belongs to the suborder of Eimerian coccidia, which cause coccidiosis in may animals hosts (1). Crypotosporidiosis as a disease of intestinal tract, primarily of neonatal farm animals specially calves (2,3) have been reported to cause clinical illness and diarrhoea. The disease has been reported in lambs, foals, goats, deer and other species as well (4).

Many isolates of cryptosporium that infect mammalian species lack host specificity, and infected mammal can act as a source of infection for another animals or human, so the disease become a new zoonosis (5). At least two species of cryptosporium have been proposed in ruminants (6,7,8). cryptosporium muris which found in the stomach of the common mouse by Tyzzer (9) , has been proposed to be regarded as the type species that infect mammals and it is believe to colonize the abomasum of calves (10,7,8). C. parvum is the other cryptosporium species which cause intestinal infection in numerous mammal host species. Different sorts of treatment have been tried but no drug was effective for cure crypotosporidiosis specially in calves (11).

The aim of this study is to determine the frequency of occurrence and relationship of cryptosporidial infection in calves with chronic-responsive diarrhoea (1-4 weeks old) in two different breeding systems.

MATERIALS AND METHODS

1- Collection of faecal samples:

During the period of mid 1994-1996, eighty eight faceal samples were colleted from calves with chronic diarrhoea (age 1-4 weeks). For purpose of comparison , faecal samples from apparently healthy calves were also collected.

2- Farm and animals:

Thirty two faecal samples were collected from calves at Al-Wehda closed breeding system farm (group A) and fifty six from Al-Radwanyia area around Baghdad which is regarded as open method of breeding system (group B). Diarrhoeic calves showed clinical signs of fever, depression anorexia varying degree of dehydration, emaciation weakness and collapse.

3- Detection of cryptosporium oocysts:

The oocysts were detected in the faecal smears from diarrhoeic and control groups of calves using the method of Baxby et al. (12).

RESULTS

Examination of safranin-methylene blue stained faecal smears of positive samples shows that cryptosporium oocysts were seen as orange-pink bodies usually spherically to slightly ovoid in shape and present numbers in the smears from diarrhoeic calves.

Out of 32 samples collected from group A, 21 samples (65.6%) were positive for cryptosporium oocysts in the faecal smears , and out of 56% samples collected from diarrhoeic calves of group B, only 24 (42.8%) showed positive results (Table 1). Whereas the percentage of positive cases from apparently healthy calves of group A and B were 12.5 and 4.7 respectively (Table 1). cryptosporium oocysts in the faecal samples from control group were present in few numbers.

The frequency of occurrence of infection with age group of diarrhoeic calves is shown in Table 2. It indicates higher rate of crypotosporidiosis in two weeks calves in comparison with older claves.

Table 1 . The rates of positive cryptosporidial infection in diahrrhoeic and non-diarrhoeic groups of calves.

Farm	No. of samples	Positive cases	Percentages
I. Diarrhoeic group			
A	32	21	65.60
B	56	24	42.80
	88	45	51.13
II. Non-diarrhoeic group (control)			
A	16	2	12.50
B	21	1	4.76
	37	3	8.10

Table 2 . Occurrence of cryptosporidiosis in calves of different age groups.

Age (weeks)	No. of calves	Percentage of infection
1	18	20.45
2	32	36.36
3	23	26.13
4	15	17.04
	88	

DISCUSSION

This study shows that cryptosporidiosis is a significant causes of chronic diarrhoea in calves (1-4 weeks of age). The association of the disease in calves with chronic non- responsive diarrhoea has been reported (13,3). The total prevalence of crypotosporidial infection in diary calves with diarrhoea was 51.1%. The incidence of the disease in calves of group A was 65.6% and 42.8 % in group B . This result is in accordance with the findings of Markovics et al (14) who showed that 69.5% of dairy calves (1-3 weeks old) were infected with cryptosporidiosis. Other reportd that in 55% of dialrrhoeic calves , cryptosporium was the only pathogen isolated from the faeces (15) . However, the infection rates were higher when compared with studies of other research workers (16,17,18) where the rates of occurrenece of the disease in diarrhoeic calves were 33.3% , 25% and 29.4% respectively.

High incidence of crypotosporidiosis in calves with chronic diarrhoea may be attributed to the fact that cryptosporium species have a short and direct life cycle which completed in 3-4 days in young and susceptible hosts (4). Many diarrhoeic calves were found to be infected with cryptosporidiosis may be due to high environmental contamination in very short time caused by faeces of calves with persistent diarrhoea which may last for upto 10 days . It was also found that the potential oocyst output from ingestion of

single oocyst is over 2000 and diarrhoeic calves can shed as many as 10 millions per gram of faeces (4).

In this study , the findings that higher rates of infection occur in calves at farm A (closed system) the calves in group B , may reflect the dominance of cryptosporium causing diarrhoea in calves of group A (65.6%) than (42.8%). This may be attributed that large numbers of calves were confined in the farm which suggests a build up of contamination of cryptosporium oocysts excreted with faeces of infected calves (19) which act as reservoir of infection to the healthy calves (4). Similar to the findings of this study were made by Gonchi and Leoni (20) who pointed out that crypotosporidiosis is an emerging disease of intensive calf husbandry . Beside, infected mice and rats were also found to play a role in transmission of the disease to human beings and calves (21) causing high rates of infection with cryptosporium. Klesius et al.(22) found that oocysts from mice were infected for calves which may develops non-fatal clinical cryptosporidiosis. However, in group B, there is no such confinement of large numbers of calves in the same premises which gives less opportunity for contamination and infection of calves.

Detection of cryptosporium oocysts in the faeces of healthy non-diarrhoeic calves may be attributed to the difference of isolates virulence among cryptosporium species beside resistance individual variation among calves (23). Presence of the oocysts in faeces of calves without clinical signs of diarrhoea has been reported (24).

Occurrence of the disease in relation to age group of calves shows the incidence of crypotosporidiosis higher in calves of two weeks of age (36.6%) with subsequent drop in the third week and fourth week of age. These findings were in agreement with studies in Iraq (16,26) and in the world (3,25). This may be also explained by

the findings of Angus (4) who indicated that clinical crypotosporidial infection were most common at 1-2 weeks of age.

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مرض الابواغ الخبيثة في العجول المصابة بالاسهال المزمن

غالب سوادي عبد الرضا

فرع الطب الباطني والوقائي - كلية الطب البيطري- جامعة بغداد

الخلاصة

لقد كان الهدف من اجراء هذا البحث هو دراسة دور مرض الابواغ الخبيثة في حدوث مرض الاسهال غير المستجيب في العجول بعمر 1-4 أسابيع ودور نظام التربية في التاثير على نسبة حدوث المرض اضافة الى عمر الحيوان المصاب.

وقد تبين ان نسبة الاصابة الكلية كانت 51.5٪ باستخدام مسحات البراز للكشف عن المرض.

كما ان الدراسة اظهرت ان نسبة عالية من الاصابة حدثت في نظام التربية المغلق (65.6 ٪) مقارنة بطريقة التربية المفتوحة عند المربين والتي بلغت 42.8٪. ولقد كانت اعلى نسبة الاصابة في العجول بعمر اسبوعان 36.6٪ مع هبوط نسبة الاصابة مع زيادة عمر العجل.

لقد اوضحت الدراسة ان بعض العجول غير المصابة بالاسهال قد افرزت بيوض الابواغ الخبيثة ولكن بنسبة تقل كثيرا عن النسبة في العجول المصابة بالاسهال المزمن حيث كانت النسبة الكلية 8.1٪.