Cryptosporidiosis In Man And Animals In Al-Tameem Province/ Iraq.

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Summary

This study was conducted on 790 stool samples from infants and young children up to ten years of age, suffering from acute diarrhea who attended Kirkuk Pediatric Hospital, from the beginning of August 1999 of July 2000.

The animal study was carried on 160 lambs, 130 calves and 110 kids suffering from diarrhea in private veterinary clinics in Al-Tameem province .

The rate of acute cryptosporidiosis was (10%).There was no significant difference between the two sexes .It was higher in winter and spring than summer and autumn months .

The infection rate was higher among children in contact with poultry than those in contact with cattle and sheep and was lowest among those not in contacts with animals.

The distribution of cryptosporidiosis among domestic animals was as follows: in lambs, calves and kids the infection rates were 20%, 19.2% and 23.6% respectively.

داء الأبواغ الخبيئة في الأنسان والحيوان في محافظة التأميم/العراق

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الخلاصة

أجريت الدراسة على 790 من الرضع والأطفال الصغار الى حد 10 سنوات الذين يعانون من الأسهال الحاد والذين راجعوا مستشفى الأطفال في كركوك للفترة من بداية آب 1999 الى نهاية تموز 2000.

الدراسة على الحيوانات أجريت على 106 من حملان الأغنام، 130 من العجول،110

من جداء الماعز يعانون الإسهال في العيادات البيطرية الخاصة في محافظة التأميم.
كانت نسبة الأصابة بالأبواغ الخبيثة الحادة 10% . لم يظهر فرق معنوي بين الجنسين وأن الأصابة في أشهر الشتاء والربيع كانت أعلى من أشهر الصيف والخريف.
وجدت نسبة الأصابة أعلى في الأطفال الذين يتماس مع الدواجن من الذين يتماس مع الأبقار والأغنام وكانت الأصابة أوطأ بين الذين لم يكن لهم تماس مع الحيوانات.
كانت نتائج أنتشار المرض بين الحيوانات الأليفة كالأتي في حملان الأغنام 20% و في العجول 19.2% وفي جداء الماعز 23.6%.

Introduction

Cryptosporidiosis is a protozoal, zoonotic, emerging disease of medical and veterinary importance which causes intestinal and extra-intestinal disorder in both man and animals (1&2).

The disease had been known for ages in animals in about 45 different species, including poultry and other birds, fish, reptiles, small mammals (rodents, cats, dogs) and large mammals, particularly cattle and sheep, but not very long ago it has been recognized as a cause of diarrhea in human (3), in which the first severe cases of human cryptosporidiosis were reported during the period from 1976-1981 in AIDS patients (4).

In mammals, infection usually appears to involve Cryptosporidium parvum, a species that infects the epithelial cells of digestive and respiratory organs. Enteric cryptosporidiosis is being increasingly recognized as a common cause of scours in farm livestock, especially young ruminants (5). In humans, it is a well-recognized cause of watery diarrhea and vomiting in immune-competent persons, whereas it causes persistent diarrhea in immune-deficient individuals, especially those with acquired immunodeficiency syndrome AIDS (6).

The study was conducted to elucidate the distribution of cryptosporidiosis among children up to 10 years old and young ruminant (lambs, calves and goat kid) in Al-Tameem province.

Materials And Methods

A study was conducted among 790 infants and young children,369 males and 421 females, up to 10 years of age, suffering from acute diarrhea for less than two weeks who attended Kirkuk Pediatric Hospital from beginning of August 1999 to end of July 2000 and on 160 lambs, 130 calves and 110 goat kids brought in private veterinary clinics in Al-Tameem province, from beginning of September 1999 to end of December 2000.

Stool samples were collected from each child who had been diagnosed primarily as acute gastroenteritis case by pediatrician and each animal suffering from diarrhea. The samples of children were examined in Kirkuk. Pediatric Hospital Laboratory and the animals fecal samples were examined in private veterinary clinic laboratories. General stool examination was carried out for each specimen using wet mount technique Cryptosporidium infection was diagnosed by detection of oocysts in the feces using modified Ziel Neelson technique (7).

The statistical analysis was performed, using chi–square test, to compare the significant difference between groups .

Results

From the study on 790 patients with acute gastroenteritis, Cryptosporidium oocysts were found among 79 (10%) patients.

The age distribution of patients is demonstrated in Table (1). The rate of infection was highest among 2-3 years old, followed by those from 1 month-1 year, 4-5, 6-7, and 8-10 years respectively.

Regarding sex distribution, there was no significant difference between males (10.02%) and females (9.97%) (Table 2).

Table (3), indicates that the rate of infection in rural areas (11.51%) was slightly higher than urban ones (8.91%) but the difference between them was not significant statistically.

It is shown from Table (4), that the rate of infection in Spring and Winter was higher than Summer and Autumn. Statistically there was significant difference between seasons.

As shown in Table (5), the rate of infection was highest among those children in contact with poultry (13.12%) than those in contact with cattie and sheep (12.10%) and those not in contact with animals (5.0%) ($p<0.01$).

It is found in Table (6), that the distribution of infection is high among domestic animals .It was highest among goat kids (23.6%), followed by lambs (20.0%) and calves (19.2%) respectively. The difference in the rate of infection among animals groups was not significant statistically.

Table 1. Distribution of cryptosporidiosis in children according to age.

Age group (year)	No. examined	No. positive	Positive %
1 month-1 year	353	39	11.04
2-3	202	25	12.37
4-5	94	7	7.44
6-7	70	4	5.71
8-10	71	4	5.63
Total	790	79	10.0

$\chi^2=5.11$ d.f.=4 (P>0.05

Table 2. Distribution of cryptosporidiosis in children according to sex.

Sex	No. examined	No. positive	Positive %
Male	369	37	10.02
Female	421	42	9.97
Total	790	70	10.0

$\chi^2=0.00056$ d.f.=1 (P>0.05)

Table 3. Distribution of cryptosporidiosis in children according to residency

Residency	No. examined	No. positive	Positive %
Urban	460	41	8.91
Rural	330	38	11.51
Total	790	79	10.0

χ^2=1.44 d.f.=1 (P>0.05)

Table 4. Distribution of cryptosporidiosis in children according to seasons.

Season	No. examined	No. positive	Positive %
Summer	190	10	5.26
Autumn	180	9	5.00
Winter	220	31	14.09
Spring	200	29	14.50
Total	790	79	10.0

χ^2=18.33 d.f.=3 (P<0.001)

Table 5. Distribution of cryptosporidiosis in children with or without animal contact.

Type of animal	No. examined	No. positive	Positive %
Poultry	320	42	13.12
Cattle & sheep	190	23	12.10
None	280	14	5.0
Total	790	79	10.0

χ^2 =12.22 d.f.=2 (P<0.01)

Table 6. Distribution of cryptosporidiosis among domestic animals.

Animals	No. examined	No. positive	Positive %
Lambs	160	32	20.00
Calves	130	25	19.23
Goat kids	110	26	23.63
Total	400	83	20.75

χ^2=0.797 d.f.=2 (P>0.005)

Discussion

The rate of (10%) of cryptosporidiosis among 790 infants and young children with acute gastroenteritis reflects that cryptosporidiosis are common in children in this province, this confirm the findings of Gelany (14.6%) in Baghdad (8), Al-Sammarie (4.02%) in Tikrit (9), Khalil (20.52%) in Mosul (10) and Kadir et al. (8.82%) in Kirkuk (11).

Although statistically there was no significant difference between different age groups of children, but the rate of infection was highest among 2-3 years, followed by one month to 1 year, 4-5, 6-7 and 8-10 years respectively. This indicates that very young children suffer more than older ones, this might be related to poor sanitation and unhygienic condition of these ages (12). Khalil (10) in Mosul, found that the rate of infection was highest among one year old children.

It seems that the relationship between the distribution of infection and sex of patients is not constant, there is controversy about rate of infection in both sexes. In this study there is no significant difference in distribution of cryptosporidiosis among males and females. This is in agreement with that reported by Casemore (13), Al-Sammarie (9) and Al-Jarjary (14) but not in agreement with others who showed that the distribution of infection in males was higher than females (8 &15). The differences in the rate of infection in different studies, reflects that

the distribution of infection among males and females might be related to the immunological status of children and their mothers rather than sex, or it might be due to difference in the strains of parasites used in each study.

The distribution of infection was not significantly different in rural and urban areas, although the rate of infection in rural areas was slightly higher than urban areas. This might be explained by immigration of people during last years from city to villages and vise versa, specially due to economic sanction against the country. This finding is also reported by Kadir et al. (11) in Kirkuk but not with results of study done in Saudi Arabia (16) in which the workers found that the rate of infection in rural areas was higher than urban ones.

Regarding the seasonal distribution of infection in children, it was higher in Spring and Winter than Summer and Autumn. This finding goes with that shown by Kadir et al. (17) who indicated that the highest rate of infection was in Spring followed by Winter, Autumn and Summer.

Throwing light on the distribution of infection among children in contact with different types of animals, it is indicated that those children in contacts with poultry, cattle and sheep had higher rate of infection than those not in contact with animals. This reflects, the role of animals in the distribution of cryptosporidiosis among human beings and are an important reservoir of infection. Similar finding is reported by Kadir et al. (11) in Kirkuk.

According to knowledge of the author, this is the first study carried on domestic animals in Kirkuk. The rate of infection in lambs was (20%). It is lower than that reported in Mosul area (10), who showed the infection rate 36.43%.

The rate of infection in calves in this study 19.21% is lower than that shown by Al-Jarjary (14) in Mosul area, on the study done on 100 calves, she found the rate of infection was 36%.

In goat kids, the rate of cryptosporidiosis was 23.63% which is higher than that reported in Baghdad area by Rasheed (17) who reported the rate of infection (5.84%).

The difference in the rate of infection in this study compared to that reported in other parts of the country, might be related to geographical distribution, environmental variation and sample size or it might be due to different techniques used in each study for diagnosis of the parasite. Khalil (10), revealed that the rate of infection in children was 20.52% by iodine stain method, 19.20% by sugar flotation method, 13.91% by formalin sedimentation method, 11.23% by acid fast staining method and 10.17% by modified cold kinyoun stain method.

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