

STUDY OF PREVALENCE OF *GIARDIA* INFECTIONS IN IRAQI SHEEP OF YUESEPHIYA PROVINCE / BAGHDAD

دراسة نسبة الإصابة بطفيلي الجيارديا في الأغنام العراقية في منطقة اليوسفية / بغداد

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Abstract:

For *Giardia* investigation ,faecal samples of 145 sheep from three farms of sheep in Baghdad /Yuesephiya province, were identified by use the direct smear and zinc sulphate flotation method during the period from(Sept. 2007 to Feb. 2008). Out of 145 sheep examined , 36 sheep (24.82 %) were infected with *Giardia*. Prevalence was studied depend on the sex and age of the host. The prevalent was high in lambs 52.17% with significant difference ($p < 0.01$).*Giardia* did not show sex predisposition. Beside *Giardia* , *Haemonchuc contortus* , *Nematodirus spathiger* and *Eimeria* spp. were isolated by floating method.

المستخلص :

تم فحص عينات خروج 145 من الأغنام من ثلاثة مزارع تربية الأغنام في منطقة اليوسفية في بغداد ، بطريقة الفحص المباشر وطريقة التطويق باستعمال كبريتات الزنك أثناء الفترة من أيلول 2007 لغاية شباط 2008 ، لتحري عن طفيلي الجيارديا . سجلت الإصابة بأكياس الجيارديا في 36 من أصل 145 رأس من الأغنام بنسبة إصابة 24.82% ، وان نسبة الانتشار تبعاً إلى عمر وجنس الحيوانات . كانت أعلى نسبة إصابة في الحملان (عمر اقل من ستة أشهر) 52.17% بفرق معنوي ($p < 0.01$) عن سائر الفئات العمرية، لم يظهر اختلاف فيما يتعلق بنسبة الإصابة بين الذكور والإناث . بجانب *Giardia* تم عزل طفيليات الكوكسيديا (*Eimeria* spp.) و *Haemonchuc contortus* و *Nematodirus spathiger* .

Introduction:

Giardia sp. is a flagellated protozoan which inhabits the small intestine of humans and range of mammal, amphibian, and birds species (Soulsby , 1982 ; Thompson *et al.* 1993 ; Stuart, *et al.* 2003). The parasite has a world-wide distribution and is recognized as a very important causative agent of diarrhea and other symptoms in humans, dogs, cats, and other host species (Kulda and Nohynkova, 1978, Radostits *et al.* 1997, Brooks *et al.* 2001).

Giardia sp. has tow stages (the trophozoite and the cyst) are involved in its life cycle, and the mode of transmission is faecal-oral route. The motile trophozoite colonized the small intestine and divide by longitudinal binary fission, and the cyst is excreted in the faeces of the host. (Dey and Dey 1997). Traditionally , it was thought that *Giardia* was strictly host specific (Kulda and Nohynkova 1978) , but there is a many evidence indicating that transmission can occur between different host species (Thompson *et al.* 1993 Ey *et al.*, 1996) , and successful experimental transmission of *Giardia lamblia* isolated from human to dogs in Baghdad province (Swadi, 2000) *Giardia* has been associated with reduced animals production in the rumment (Deuerlu, *et al.* 2005) it appears to occur in animals of all ages (Meloni, *et al.* , 1995) Although *Giardia* infections have been reported for sheep in many parts of the world (Olson, *et al.* 1997; Diaz, *et al.* 1996). Prevalence data have often varied markedly. The high prevalence of *Giardia* in neonates and lambs is well known (Taylor, *et al.* 1993; Xiao, *et al.* 1994).

Detection procedures for

acquiring, cleaning, concentrating, and identifying parasites differ significantly from laboratory to

laboratory. Some techniques are markedly more sensitive and accurate than others in detecting and identifying parasites, thereby influencing the data upon which the prevalence of infection is based (Wade, *et al.* 2000).

The major objective of the present study was to determine the recent prevalence of *Giardia* spp. in sheep of Yuesephiya province/Baghdad, Iraq.

Materials and methods :

Samples collection :

A total of 145 faecal samples collected directly from rectum of sheep of different age and sex (table 1), examined in the laboratory of animal production department of Al-Moussyab technical institute , during Sept. 2007 to Feb. 2008, in Yuesephiya province, of Baghdad city , for the presence of *Giardia* species.

Table 1 distribution of sheep according to age and sex

age	No.	sex	No.
1-6 months	23	Male	25
7-12months	55		
1-2 year	46	Female	120
Over 2 year	21		

Samples identification :

All samples were processed for direct smear, faeces suspended in saline (Coles , 1986) , and zinc sulphate flotation method, select a large test tube , about one-quarter fill the tube with the zinc sulphate and add 0.5 g of faeces by use a glass rod ,break the feces into small pieces and emulsify ,than fill the tube with the zinc sulphate and mix well.

After that stand the tube in a vertical position in a rack , carefully place a cover glass on top of the tube and allow to stand for 45 minutes , finally lift the cover glass by a straight pull upwards and place it face downwards on a slide . The eggs and cyst will be found adhering to the cover glass, examine microscopically the entire preparation. Count the cysts and eggs, report the number of cyst per gram of faeces, by multiplying each number by two. (Cheesbrough, 1981).

Statistical analysis: variance and the significance differences were determined by chi square (Steel and Torrie, 1980).

Results and Discussion :

Faecal samples from 145 sheep randomly selected from three farms in Yuesephiya province, were examined to investigate the prevalence of *Giardia* infections. Prevalence rates of *Giardia* spp. in sheep was 36 of 145(25.82%) from different age and sex sheep (Table 2).

The prevalence of *Giardia* infections in sheep was determined in Southern Spain by Diaz, *et al.* (1996) 6.26% .and approximately 6–82% in North America (Xiao , 1994). *Giardia* was identified in 38% of sheep from different Canadian farms (Olson, *et al.* 1997).

Giardia spp. cysts were found in all age categories , but prevalence was highest in animals 1-6 months old with 12 of 23animals (52.17 %) shedding cysts, the result were significantly different on $p < 0.01$. These results were in agreement with that reported by(Taylor, *et al.* (1993) who found Fifty-nine of 86 lambs (68.6 %) excreted *Giardia* cysts .

Among the 55 samples taken from sheep younger than 7-12 months old, fourteen were positive for *Giardia* spp. cysts. The parasite was found in 8 of the 46 animals (1-2 years old) (Table 2). Two

of 21 animals over 2 years were infected with *Giardia* cyst. In the present study , cyst excretion rates ranged from 700-1500 cysts per gram of faeces, which are significantly lower than those described in the Xiao, (1994).

Table 2. The prevalence rates of *Giardia* spp. in different age groups.

Age	<i>Giardia</i> spp.	
	Number of infected animals/ total animals	(%)
1-6 months	12/23	52.17
7-12months	14/55	25.45
1-2 years	8/46	17.39
Over 2 years	2/21	9.52
Total	36/145	25.82

Prevalence rates of *Giardia* spp. in male and female were 20 % and 25.83 %, respectively (Table 3),that mean there is no significant differences in male and female infection, this result agree with that reported by Barlough, (1979) and Hahn, *et al.* (1988) they reported that there was no effect of sex on rate of infection by *Giardia* .

Table 3. Prevalence rates of *Giardia* spp. in male and female.

<i>Giardia</i> spp.		
Sex	Number of infected Animals / Total animals	(%)
Male	5 / 25	(20)
Female	31 / 120	(25.83)

Knowledge of age and seasonal variations in the prevalence of shedding of *Giardia* cysts by sheep may be helpful in designing prevention plans to minimise economic losses due to this parasite and potential hazards to public health.

Beside *Giardia* , *Haemonchuc contortus* , *Nematodirus spathiger* and *Eimeria* spp. were isolated by floating method . (Table 4.)

Table 4. Prevalence rates of parasites in the sheep

Parasites	Number of infected animals / Total animals	(%)
<i>Haemonchus contortus</i>	124/145	(85.52)
<i>Nematodirus spathiger</i>	80/145	(55.17)
<i>Eimeria</i> spp.	25/145	(17.24)

Although *Giardia* infections have been diagnosed in sheep in many parts of the world, prevalence data have often varied markedly. The high prevalence of *Giardia* in neonates and young lamb is well known (Taylor, *et al.* 1993).

Detection procedures for acquiring, cleaning, concentrating, and identifying parasites differ significantly from laboratory to laboratory. Some techniques are markedly more sensitive and accurate than others in detecting and identifying parasites, thereby influencing the data upon which the prevalence of infection is based (Flanagan, 1992; Thompson, 1992), the zinc sulphate flotation method detected 36 cases of *Giardia* infection compared with 22 by direct smear (See table 5).

Table 5. Isolation rates of *Giardia* spp. in sheep by direct smear and zinc sulphate flotation method.

<i>Giardia</i> spp.*	Number of infected animals/ total animals	(%)
direct smear	36/145	(25.82)
zinc sulphate flotation method	22/145	(15.17)

*significant differences $p < 0.05$.

The infected sheep by *Giardia* cysts do not show diarrhea , this may be mean sub clinical infection by *Giardia*, and no trophozoite was seen in their faeces , but is well observed weight loss . The important of infection by *Giardia* not in animals health alone , but in the potential zoonotic diseases.

Giardia has been isolated from many animal species and until the 1950s these isolates were believed to be highly host specific and were named according to host species, for example ,*G. bovis* , *G. canis* , over 40 species were thus described (Flanagan, 1992).*G. lamblia* being the species which infect man and other mammals (Thompson , 1992) .

References:

- Barlough, J.E. (1979). Canine Giardiasis: a review. J. Small Animal. Practice, 20: 613 - 623.
- Brooks, G.F., Butel, J.S. and Morse, S.A. (2001) Medical microbiology. Twenty- Second Ed. Appleton and Lange, United States of America.
- Cheesbrough, M. (1981). Medical Laboratory Manual for Tropical Countries. Vol. 1, 1st ed., Stephen Austin and Sons, England.
- Coles, E.H. (1986). Veterinary Clinical Pathology. 4th ed. Press of W.B. Saunders Co.
- Deuerlu, S., Eluks, A .Z. Kalkan, K. and Eluk, S. (2005). Prevalence of *Cryptosporidium* spp. and *Giardia* spp. in Cows and Calves in Sivas. Turk J Vet Animal. Sci. 29 : 995-999.
- Dey, N.C. and Dey, T.K. (1997). Medical Parasitology. 10th ed., New Central Book. Agency, India .pp. 100-110
- Diaz, V.; Campos, M.; Lozano, J.; Manas, I. and Gonzalez, J. (1996). Aspect of animal giardiasis in Granada province (South Spain). Vet. Parasitol. 64(3):171-176.
- Ey, P.L.; Bruderer, T.; Wehrli, C. and Kohler, P. (1996). Comparison of genetic groups determined by molecular and immunological analyses of *Giardia* isolated from animals and humans in Switzerland and Australia. Parasitol. Res. 82: 52-60.
- Flanagan, P.A. (1992). *Giardia* diagnosis , clinical course and epidemiology : a review . Epidemiology and Infection, 109: 1-22.

- Hahn, N.E.; Glaser, C.A.; Hird, D.W. and Hirsh, D.C. (1988). Prevalence of *Giardia* in the feces of pups. J. Am. Vet. Med. Assoc., 192 (10): 1428- 1429.
- Kulda, J. and Nohynkova, E. (1978). Flagellates of the human intestine and intestine of other species, In: Parasitic Protozoa, ed. by, J.P. Krier, Academic Press, New York and London, 2: 69-104.
- Meloni, B.P.; Lymbery, A.J. and Thompson, R.C.A. (1995). Genetic characterization of isolation of *Giardia duodenalis* by enzyme electrophoresis – implications for reproductive biology, population, structure, taxonomy and epidemiology. J. Parasitol. 81(3):368-383.
- Olson, M.E.; Thorlakson, C.L.; Deselliers, L.; Morck, D.W. and Mcallister, T.A. (1997). *Giardia* and *Cryptosporidium* in Canadian farm animals. Vet. Parasitol. 68(4):375-381.
- Radostits, O.M.; Blood, D.C. and Gay, C.C. (1997). Veterinary Medicine Textbook of the Diseases of Cattle, Sheep, Pigs, Goats and Horses. 8th ed., W.B. Saunders Co., London .pp.1212-1235.
- Soulsby, E.J.L. (1982). Helminthes, Arthropods and Protozoa In Domesticated Animals. 7th ed., Bailliere, Tindall, London.
- Steel, R.G. and Torrie, J.H. (1980). Principles and produced of statistics: A biometrical approach. 2nd ed. MacGraw Hill Book Co., New York.
- Stuart, J. M.; Orr, H. J.; Warburton, F. G.; Jeyakanth, S.; Pugh,C.; Morris, I. ; Sarangi,J. and Nichols, G. (2003). Risk factors for sporadic giardiasis: A case-control study in Southwestern England. Emerging Infect. Dis. , 9(2): 229-233.
- Swadi, H. A. (2000). Epidemiology study on giardiasis in dogs in Baghdad province. Thesis of Master of Science, College of Veterinary Medicine, Universityof Baghdad.
- Taylor, M.A.; Catchpole, J.; Marshall, R.N. and Green, J. (1993). Giardiasis in lambs at pasture. Vet. Record. 133(6):131-133.
- Thompson, R.C.A. (1992). Parasitic zoonoses problems created by people not animals. International J. Parasitol. 22 (5): 555-561.
- Thompson, R.C.A.; Reynoldson, J.A.; Mendis, A.H.W. (1993): Giardia and giardiasis. Adv. Parasitol. 32:71-160.
- Wade, S.E., Mohammed, H.O. and Schaaf, S.L. (2000). Epidemiologic study of *Giardia* sp. infection in dairy cattle in southeastern New York State. Vet. Parasitol. 89: 11-21.
- Xiao L: 1994, *Giardia* infection in farm animals. Parasitol Today 10:436–438.
- Xiao, L.H.; Herd, R.P. and McClure, K.E. (1994). Periparturient rice in the excretion of *Giardia* sp. cysts and *Cryptosporidium parvum* oocysts as a source of infection for lambs. J. Parasitol. 80(1):55-59.