TENUICOLLOSIS IN SLAUGHTERED SHEEP AT DUHOK ABATTOIR- KURDISTAN REGION OF IRAQ

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(Reeived 15 November 2010,Accepted 26 April 2011)

Keywords: *Cysticercus tenuicollis* , incidence, abattoir

ABSTRACT

A study on the prevalence and monthly incidence of *Cysticercus tenuicollis* metacestodes of sheep were carried out in Duhok abattoir(north of Iraq) .The work was conducted during the period from October.2008- to September.2009 by weekly regular visits to the slaughterhouse. All slaughtered animals were apparently healthy, were of local breed, of both sexes originated from some areas with non –descriptive features. Visual inspection of the lesion and traditional procedure were followed.Age,sex and different locations of cysts were widely investigated in each species and then tabulated . Out of 4716 sheep examined, only 31(0.7%) of sheep had cysts, with absence of these cysts in both goats and cattle.

However, the vesicles were only present in female sheep. The highest infection rate was found in sheep older than 2 years(1.7%),while the lowest was in sheep younger than one year(0.1%).The heaviest incidence was observed in Febrewery,2009(1.4%)and the lowest was in Jun and July(0.3%).

The commonest locations of the cysts were in the mesentery (29%) followed by the uterus (16%) with few cases in other visceral organs.

The study and the findings associated with uncommon locations of the cysts in the diaphragm, ovary and urinary bladder represented the first record in Duhok region.

It can be conducted that *C.tenuicollis* causes losses among carcasses and edible offals in livestock slaughtered at Duhok abattoir. Only sheep play insensible role in dissemination of the infection.

INTRODUCTION

Cysticercus tenuicollis is a metacestode of canine tapeworm *Taenia hydatigena* which is the largest cestodes of the dogs (1).The larval stage i.e. *C.tenuicollis* is a cyst loosely filled with transparent fluid, along necks which is usually found in the abdominal viscera attaching to their cavities and livers of infected animals(2).

Detection of those cysts is performed commonly at meat inspection enterprises.Tenuicollosis is frequently associated with hemorrhagic tracts in the livers of acute cases (3,4).

In slaughter animals, tenuicollosis has an important economic loss due to condemnation of offal's containing these larvae (5,6,7).A part from such fore-mentioned damage, the metacestode may serve as a predisposing cause to black disease (8) or may lead to acute traumatic hepatitis (9) as well as a contributory agent of peritonitis(2).On the contrary, similarly to other canine tapeworms, the infection with *T. hydatigena* (adult stage) to the shepherd dog in the rural areas or butcher dogs in urban" definitive host" is not harmful to the dog(10).Locally, much attention had been drawn on hydatid cyst disease(11),whereas surveys and investigations on tenuicollis are still scares. Interestingly, identification of liver cysts of *Echinococcus granulosus* and those of *C. tenuicollis* is carried out easily with no confusion amongst meat inspector of Duhok abattoir.Hence; it

ws the purpose of the current paper is to indicate the frequency and level of infection in sheep, slaughtered at Duhok abattoir.

MATERIAL AND METHODS

The present investigation was based on the complete post-slaughter carcass inspection of 4716 sheep. All slaughtered animals were of local breed mostly karadi sheep with few exceptions –were originated in Duhok area and their suburbs and villages(northern part of Iraq).It was informed that all animals were apparently healthy at pre-slaughter examination and before being slaughtered. Weekly regular visits were carried out in to Duhok municipal slaughter house during the period from Octo.2008-Sept.2009.Age,sex and sites of possible parasite locations of the carcass were broadly studied and labulated.Organs inspected included mesentery,heart,ovary,kidney,liver,diapgragm , uterus and urinary bladder of all animals .Detection of age was achieved as mentioned by other(12).Certicerci suspended to the abdominal, thoracic and pelvic cavities were collected from the hosts ruminants and were brought in the Laboratory of Parasitology,College of Vet. Medicine, for confirmation and further identification. Examination of cysts was achieved visually following traditional standard procedurs as mentioned in (2).

Notably, differentiation between lesion of *E.granulosus* and *C.tenuicollis* was described earlier by many authors (13,14).

RESULTS

Total percentage of infection rates with *C.tenuicollis* in sheep were 0.7%, (Table 1).The prevalence of these cysts as to sex was presented in (Table 1) .Out of 4716 sheep only the cysts were observed in 31 females of sheep representing an infection rate of (0.7%) (Table1),it was clear that an important effect of sex of animals examined could be deduced from the table.

Regarding the age of animals, the highest and the lowest rates of infection were observed in sheep older than two years (1.7%) and lesses than one year(0.1%)(Table 1), also revealed that the highest infection rates were observed in February,2008(4.54%),followed by August(2.9%) in sheep older than two years, while low infections were saw in other months Viz.,October,November and March within the same group.

Our findings indicated that the cystcerci in inspected sheep had a tendency to be located in the mesentery (29%) (Fig.2).The percentage of cysts founds in other organs was as follows: 12.9%in diaphragm, urinary bladder and ovary (Fig.3, 4) and uterus but 6.5%in each of heart and (9.7%) in liver (Fig.1) Whereas, in kidney were about (3.2%) (Table 2).An extra-ordinary finding was the co-occurrence of both tenuicollosis and hydatidosis in the liver of some old ewes.

Table1: Prevalence rate of tenuicollosis at different age groups in both sexes of sheep

Months	No. of Exam.	No. and Infected rate %	Age groups (year)											
			Less than(1 year)				(1-2 years)				More than (2 years)			
			Male		Female		Male		Female		Male		Female	
			No. Exam.	Total infection rate %	No. Exam.	Total infection rate %	No. Exam.	Total infection rate %	No. Exam.	Total infection rate %	No. Exam.	Total infection rate %	No. Exam.	Total infection rate %
October	*213*	*1 0.45 %*	*57*	*0*	*26*	*1 3.8%*	*11*	*0*	*84*	*0*	*2*	*0*	*33*	*0*
November	*697*	*5 0.7 %*	*69*	*0*	*136*	*0*	*50*	*0*	*307*	*4 1.3%*	*2*	*0*	*133*	*1 0.8%*
December	*505*	*4 0.8 %*	*32*	*0*	*0*	*0*	*86*	*0*	*182*	*0*	*65*	*0*	*140*	*4 2.9%*
January	*301*	*3 0.99 %*	*27*	*0*	*55*	*0*	*30*	*0*	*94*	*1 1.06 %*	*0*	*0*	*95*	*2 2.1%*
February	*346*	*5 1.44 %*	*43*	*0*	*67*	*0*	*46*	*0*	*80*	*0*	*0*	*0*	*110*	*5 4,54 %*
March	*362*	*2 0.6 %*	*60*	*0*	*117*	*0*	*4*	*0*	*83*	*0*	*10*	*0*	*88*	*2 2.2%*
April	257	1 0.4 %	52	0	64	0	20	0	60	0	8	0	53	1 0.4%
May	450	3 0.6 %	54	0	78	0	30	0	88	1 1.1%	37	0	163	2 1.2%
June	525	2 0.3 %	120	0	60	0	25	0	79	0	14	0	227	2 0.8%
July	320	1 0.3 %	30	0	46	0	58	0	30	0	25	0	131	1 0.8%
August	260	1 0.4 %	55	0	45	0	20	0	34	0	78	0	28	1 3.6%
September	480	3 0.6 %	59	0	88	0	90	0	72	1 1.3%	56	0	115	2 1.7%
Total	4716	31 0.7 %	658	0	782	1 0.1%	470	0	1193	7 0.6%	297	0	1316	23 1.7%

Table2: Prevalence of tenuicollosis at different organs in both sexes of sheep

Examinrd organs	Infected organs in females	Infected organs in males
Mesentery	9(29%)	0
Heart	2(6.5%)	0
Ovary	4(12.9%)	0
Kidney	1(3.2%)	0
Liver	3(9.7%)	0
Diaphragm	4(12.9%)	0
Uterus	4(12.9%)	0
Urinary bladder	4(12.9%)	0
Total	31(100%)	0

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Fig.1; Showed the cyst *C.tenuicollis* on the liver
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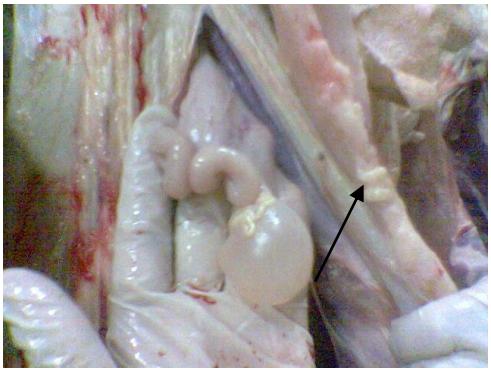
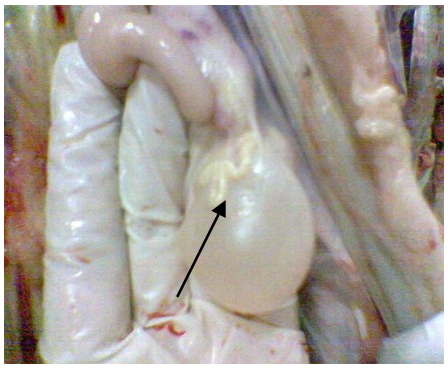
(Fig.2) Showed the cyst *C.tenuicollis* on Mesentery





(Fig.3, 4) Showed the cyst of *C.tenuicollis* on the ovary

DISCUSSION

Detection of *C.tenuicollis* was performed at meat inspection plan which is a usual practice followed in this study(12),rather than those depended upon antigenic specificity of tenuicollis cyst fluid which is applied in investigation, research and experimental studies(10).Upon our best available knowledge,tenuicollosis has not been recorded in this area, hence this work represent the first report with regard the parasite.However,such documents was unfortunate and may reflect huge economic losses due to rejection of offals-harboring such aparasite(5,6,7).In meat inspection practice, meat and edible offal's may be unfit for human consumption due to religious,pathgological and aesthetic point of views(15).

Consequently ,tenuicollis-contained organs are not suitable for marketing awing to the taler agents, despite being non-zoonotic.it is worthy to mention that the adult worm i.e.*T.hydatigena* was reported earlier in Iraq by several

researchers(16,17,18,19).On the contrary, of most host-specific parasites,*T.hydatigena*-which is the largest tapeworm of the doge,(1)has large number of intermediate hosts including whit tailed deer(20),non-domesticated boar(21),and game cervid(22).In different part of the world, the infection rate of tenuicollosis ranged between 8.3%-34.2% of goats and 4.4% of sheep in Nigeria(23,24,25);16.7% in sheep of Germany(26);27.3% of goats and 37.03% of sheep of Uttar Pradesh-India(27)11.4-15.2% in New south Wales-Australia(28).The prevalence was between 37.1-79% of sheep and 53% of goats of Ethiopia(29,30).

A commission survey in England showed an incidence of 8% in 70000 slaughtered lambs (12).

In neighboring countries, the prevalence ranged between 6.2% of goats and 9.2% of sheep in Jordan(31);18.04% of goats and 12.87% of sheep in Iran(32).In Turkish sheep, the prevalence was 24.1%(33),up to 65.6%(34) or even 72.8%(35).

In Iraq, the available reports of infection rates were 4.86%in lambs and 18.04% in older sheep with 1.03% in cattle at Mosul abattoir in (1999) (36) or 1% in the sheep of Basra slaughter house in(1987) (37).

Our results showed that the infection rate in sheep was (0.7%) with no infection in both goats and cattle. It is evident that the infection rate of the current study is much lower than those reported above.Noticeably,surveys and epidemiological studies are widely determined by several factorsi.e.attitude,magnitude,latitudeofare,season dry, arid, rainy, moist), climate, zoogeography, type of soil, rainfall levels. It is supposed that all these are

detrimental or even, adverse for the life cycle of the parasite.However, it is ‘thought’ that other agents may contribute to lessen the incidence such as animals husbandry, feeding behavior and local grazing practice. In this area, sheep and precisely goats and cattle are raised in door as ‘intensive rearing’ which is not permitted for outdoor grazing. This management practice does not allow the animals to pick eggs soiling pasture.

Also, low number of the final hosts lodging the cestodes may contribute for less field contamination, to give lower infection rates.Seemingly; Iraq is asubject for the last few years to drought which lead to formation of broad and long regions of arid and barren lands. These condition create scarce grazing lands.Subsequently, low infection rates could be expected.’browsing’is characteristic grazing behavior pattern of goats which meano literally’ eating of leaves of trees and bushes’. These leaves are rarely soiled by dog’s faeces.This normal type of goats feeding lessens the opportunity for further infection. One the other and, (10) reported that sheep among farm animals is the particular ruminant contract with *C.tenuicollis*.

The impact of sex on animals exposed to natural infection is poorly studied in many studies. In the present survey ,only females were prone to infection. It is not known whether sex hormones play a certain role in questionable.However,the biological demand for feed is much greater in female that male to meet requirements of gestation and location which needs more grazing with direct and proportional possibility of infection. In intensive raising regimes, only males are selected for fattening, reared in special paddocks, Their feed is mostly barely supplemented by a combination of mineral salts and

vitamins. As mentioned ealier,these animals are confined and are not allowed to graze outdoor. Their ration is typically'artificial'with no chance or access to contact with dogs and their parasites.Senlik(2008)found no significant difference between sex groups among Turkish sheep.

The results showed that sheep older than 2 years were more frequently infected than younger sheep i.e. 1-2 years or younger(table 1).
These findings are on the contrary to results of many studies. for example, 38,39,2,12 reported that heavy infections occur in young lambs leading to inevible death.Gmmall(1969)links the low prevalence rate observed in one year old sheep to *T.hydatigena* is to maternal immunity.However,other surveys indicate that older sheep have higher infection rates(31,27,36,33)which is quite similar to our observation.Metacestodes infection *E.granulosus* and tenuicollosis usually are higher in old and aged animals. This may be due to the adequate time elapsed for maturity of the parasite.Consequently, those diseases are not expected to occur in lamps or young sheep. In this context, the in direct life cycle to be mature and gravid, necessitating older ages.

Monthly or seasonal incidence of tenuicollosis is not well eluicidated in many papers. Our findings indicated the heaviest infection rates occurred in February which was somewhat related to rainy and humid season. It was recorded previously that the disease concur with rainy wet seasons which is suitable for perpetuation the life cycle of the parasite. similar observation were found by many workers(27,30) .

The commonest location of the cysts in this study was the mesentery (29%) followed by uterus, ovary, diaphragm , urinary bladder (16.1%) and later by other visceral organs. This is the frequent distribution of the lesions. The obtained sequences of the cysts of this study are in consistent with findings of other studies having quite similar pattern of locations (2, 22,).

Al-aboudi,1987 (40) referred to the rare occurrence of the cysts in the lungs of infected animals.(32) and found that the cysts were significantly present in the omentum,followed by liver and mesentery with few cases in either of lung,heart,gall bladder or absent in the uterus,peritoneum,urinary bladder and rumen.Although heart,ovary,kidney,urinary bladder and uterus are site-harbouring the cysts,were observed in the current study,no report is available relating their occurrence in their regions.Hence,it could be a first record for these locations in Iraq.In portoga,an interesting feak of unusual presence was reprted by (38) who observed these locations in Iraq.Nonetheless,such locations of viscera are not un common in many studies.Vesicles in an aberrant location Viz.,inside the chorion-allantoic membrane of seventy days pregnant ewe.

Upon the results of this study,it can be concluded that goats and cattle do not play role in the dissemination of disease in this region.Wherease sheep act as a minor intermediate host in perpetuating the life cycle of tenuicollosis.However,sheep entrails should be disposed off properly and should not be fed to sheep or butcher dogs.Also,destruction of stray and ownerless dogs is another suggestion to control the infection.

ACKNOWLEDGEMENTS

I wish like to express my deep gratitude to the sub staff and the employers of Duhok abattoir for their technical assistance in preparing samples of this study.

الأكياس المذنبة مستدقة العنق للحيوانات المذبوحة في مجزرة دهوك- اقليم كردستان-العراق

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الخلاصة

درست انتشار الاصابة بالكسيات المذنبة مستدقة العنق في الأغنام المذ بوحة في مجزرة دهوك .أجريت الدراسة خلال الفترة تشرين الاول2008-ايلول2009 بزيارات اسبوعية منتظمة للمجزرة.ان الحيوانات المذبوحة سليمة ظاهريا ومن السلالات المحلية وغير موصفة.استخدم الفحص العياني والطرائق تقليدية للكشف عن الاطوار اليرقية.كما درست تأثيرالعمر والجنس وموقع الافة للحيوانات المذبوحة و من ثم تبويبها في جداول خاصة.تبين من فحص(4716)من الاغنام وجدت الاكياس في (31)ذبيحة فقط اي (بنسبة 0.7%)،حيث لوحظت عند الإناث فقط،لوحظ ان اعلى نسبة اصابة قي الاغنام التي عمرها اكثر (وبنسبة0.1%).ان درجة من سنتين كانت(بنسبة1.7%)،وأقلها في الاغنام ذات العمر الاقل من سنة انتشار المرض كانت اشدها في شهر شباط (2008)(وبنسبة 1.4%)وأقلها في شهرتموز و اب (2009)(وبنسبة0.3%).كانت اكثر الاجزاءشيوعا في احتواءها على الكياس هي المساريق(وبنسبة29%)يتبعهاالجهاز التناسلي(وبنسبة16%)مع احتواء اعضاء أخرى.تعد هذه الدراسة والنتائجالمتعلقةبوجود الاكياس في مناطق غير مالوفة كالرحم والمبيض والمثانة البولية التسجيل الاول لها في محافظة دهوك.

يستنتج من الدراسة ان اصابة الذبائح المأكولة منها بهذه تسسبب خسائراقتصادية ضئيلة في مجزرة دهوك كم تلعب الغنام دورا هامشيا قي نشر الإصابة .حيث وجدت الدراسة أن نسبة الإصابة أعلى في الإناث مقارنة بالذكور بسبب طبيعة تربية الحيوانات في المنطقة حيث الذكور في داخل الحقول والإناث في المراعي .

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