

Prevalence and Public Health Importance of Hydatidosis in Sheep Slaughtered by Unlicensed Ways

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Hydatidosis is a zoonotic , helminthes parasitic disease that cause veterinary and human problems due to economic burden. Amis of the current study was to estimate the prevalence rate of hydatidosis infecting different organs of sheep slaughtered in street. In addition, investigate the relationship between age, gender and the infected rates in some Baghdad areas during a period from may to end of July 2018. A total of 188 sheep was examined for detection of Hydatid cyst in different organs using macroscopic and microscopic examination. The overall prevalence rate of 47.9% was recorded. The results indicate non significant differences according to age and gender, the highest rate 57% was observed in sheep more than one year old compared with small ages 31.3%. The females showed the highest rate 59.3% while the male recorded 30.7%. The most affected organ was the liver 64.4% followed by the lung 25.6% and finally the spleen 10%.Conclusion of this study indicates the higher prevalence rate lead to the necessity for control programs against hydatidosis includ preventing of illegal slaughtering.

Keywords: Zoonosis, Hydatidosis, Public health, sheep.

Hydatidosis one of the most widely recognized diseases which has economic importance in animals (reduction in milk, meat and wool production)¹ as well as health importance in humans through the high risk of mortality^{2,3}. Disease caused by the cystic larval stage of tapeworm parasite *Echinococcus granulosus* that found in the intermediate host (sheep, cattle, goat, horses, etc.) without any symptoms^{4,5}. In living animal there is no reliable methods for the diagnosis of the infection except using ultrasonography alone or in conjunction with serum antibody detection for cyst identification⁶. Based on Food and Agricultural Organization (FAO) reports, herbivorous animals are commonly infected in developed and developing countries⁷.

Transmission include cycle exists between dogs and sheep, dogs become infected

when they are fed fresh offal or scavenge infected sheep carcasses containing cysts, contaminate the pasture with their feces, re-infection of sheep occur as they grazing, drinking or foraging⁸. Post mortem detection of the cysts during meat inspection concenter to be the main method for diagnosis³. Animal handlers, veterinarians, dog owners are all at higher risk of infection since the eggs are shed with feces in the environment and contamination of fruits^{6,7}, vegetables or water intake, also by direct contact with the fur of an animal containing eggs which will be transferred on hands to the mouth⁹.

The necessity of the current work is to estimate the occurrence speed of hydatidosis that infect various sheep organs that wa slaughtered in street (out of the proper palce). This study also aimed to investigate the relationship of infected rate with age, gender a few areas in Baghdad.

MATERIAL AND METHODS

Study Area

The present study was conducted from may to the end of July , 2018. Four regions of Baghdad / Iraq (Al-shaala, Al-huria, Al-kadmia and Abo-greeb) were known to slaughter sheep in the streets by unlicensed ways and without proper hygiene were selected for this study.

Samples

After slaughtering, each of the liver, lung and spleen were examined for the presence of hydatid cyst .Samples collected from each of a total of 188 slaughtered sheep including 67 aged equal or less than one year and 121 aged more than one year. Gender is also taken into account where 75 males as well as 113 females were examined .

Diagnosis

Macroscopic examination was done to observe the presence of hydatid cysts in different organs of slaughtered sheep .The hydatid fluid was aspirated from each cyst using sterile syringe needle after cyst wall penetrated, and a cut made with a scalpel and scissors, fluid transport to a sterile plane tube¹⁰. A drop of each sample with a drop of aqueous eosin solution 0.1% was placed on

a glass slide and examined under light microscope (40X) to observed the protoscoleces and determined viability as the enviabile protoscoleces will take up the stain immediately while the viable protoscoleces take up the stain after 10 min later¹¹. significant between levels within factors and interactions was recognized, when probability (P) value <0.05. Proportions were compared by chi-square.

All statistical analysis were performed by using SPSS .21 www.SPSS.com

RESULTS

A total of 188 sheep were examined for the prevalence of hydatid cyst on post mortem inspection. Table one showed the distribution according to area. Highly significant differences were observed, the highest prevalence rate 59.6% was recorded in Abo-greeb while , the lowest prevalence rate was showed respectively at Al-shaala 53.2% ,Al-huria 44.4% and Al-kadmia 34.7%. The total prevalence rate was 47.9%

Table 2 summarizes the number of infected sheep with hydatidosis according to age. Out of 67 sheep aged equal or less than one year ,

Table 1. Prevalence rate of hydatid cyst in sheep by area

Area	P-value	Prevalence %	No. Positive	No. sheep
Al-shaala	P<0.01HS	53.2	25	47
Al-huria		44.4	20	45
Al-kadmia		34.7	17	49
Abo-greeb		59.6	28	47
Total		47.9	90	188

Table 2. Prevalence of hydatid cyst by age group in sheep

Age	No. examined	No. positive	Rate %	P-value
≤ 1 year	67	21	31.3	0.021
> 1 year	121	69	57	P<0.05
total	188	90	47.9	

Table 3. Prevalence of hydatid cyst in sheep by gender

Sex	No. examined	No .infected	Rate %	P-value
male	75	23	30.7	0.042
female	113	67	59.3	P<0.05
total	188	90	47.9	

Table 4. Prevalence of hydatid cyst according to organ of slaughtered sheep

Organ	Liver	lung	Spleen	Total
Sheep	58	23	9	90
Prevalence %	64.4	25.6	10	100
P-value	P<0.01		HS	

HS: highly significant differences

21(31.3%) were infected with Hydatid cyst while, 69 (57%) of 121 sheep aged more than one year recorded as infected . Non significant differences $p < 0.05$ were observed.

The highest rate of infection 59.3% was observed in female as 67 of 113 were infected with hydatid cyst while , 30.7% was the prevalence rate of males as 23 of total 75 were infected. Non significant differences $p < 0.05$ were recorded. Table 3

Highly significant differences $P < 0.01$ showed in table 4 between organs infected, The liver was the highest infected with hydatid cyst 58(64.4%) followed by lung 23(25.6%) and spleen was the lowest infected 9(10%)

DISCUSSION

Hydatidosis is a neglected public health problem in developing countries¹² included Iraq, despite the importance of the disease for both animals and human. According to the results of this study, the prevalence rate of hydatid cyst in sheep slaughtered at street and in illegal ways was 47.9% this high rate is due to the method of raising sheep, where they are in direct contact with large population of stray dogs which are the common definitive host of the *Echinococcus granulosus* and often feed on the infected offal of carcasses in addition to the method of feeding and feeding habit as sheep eat the lower parts of herbage in the open land during grazing which may be contaminated with worm eggs because it is far from exposure to sunlight which decrease the viability of the eggs¹³. Some studies done in Slemani province showed 12.7% prevalence rate in sheep¹⁴, Similar high rate of infection in sheep have been reported by Amin 2007¹⁵ in Slemani, Al-Berwari 2012¹⁶ and Abdullah 2010 in Duhok¹⁷. while lower rates

reported by Jarjees and Al-Bakri, 2012 in Mosul¹⁸. This difference in prevalence rate among the four area attributed to the mode of grazing, presence of the definitive stray dogs and other environmental factors¹⁹.

The current study revealed that older sheep had a higher prevalence rate 57% of infection than younger sheep 31.3% with non significant differences $p < 0.05$, the reason may be that older ages have been exposed for a long period of time of risk of infection .As well as increasing the possibility of diagnosis in carcasses by increasing the number of cysts and their size ,the same finding was recorded by Al-Qurashi and Bahnass ,2012²⁰; Elmajdoub and Rahman ,2015²¹.

Also results revealed that non significant differences was observed according to gender ,females showed the higher rate 59.3% than males 30.7% agreement with Rokni 2009²² and Salem *et al* ²³ 2011

as they stated that both sex has the same chance to get infection which usually depend on the contact with the source of infection and habit of grazing

On the other hand ,the higher presence of cysts was in liver than in lung and spleen in all studied sheep. This can be explained by the fact that the liver is the first organ in which the large larvae stabilized in after penetrating the mucosa of the intestine with the bloodstream. Many researchers were reported similar findings such as^{24,25,18}. Other workers showed disagreement in which they found , the lungs were the most predominant organ for cysts^{17,10}.

CONCLUSION

Based on the results of this study, the overall prevalence of *E. granulosus* in slaughtered sheep is considered a high 47.9% additionally; highly significant differences among the four studied areas were observed. Genders and age were revealed to be risk factors influencing the prevalence rate. It is very important to determine the prevalence of hydatidosis in sheep in order to explore the size of the problem which helps to control the disease, and minimize prevalence either in human or in animals.

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