

Prevalence of Some Infections in Liver and Lung of Slaughtered Ruminants in Koya Abattoir, Erbil, Iraq

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Abstract

This study was conducted at the slaughterhouses of Koya / Erbil governorate from (January to December 2013) on 15919 slaughtered ruminants to investigate hydatid cysts, necrosis, fascioliasis, pneumonia, and its frequency. The results showed height significant differences ($P < 0.01$) between different months and between different infections in both sheep and cattle liver, while the differences were insignificant in goats, whereas the differences were significant regarding lung infections in sheep, goats and cattle. The highest percentage of liver hydatid cyst was recorded in sheep especially in February (6.54%) followed by cattle in March (2.17%) and goat in September (0.22%). The highest percentage of liver necrosis was recorded in sheep especially in October (3.43%) followed by cattle in June (1.46%) and goat in July (0.26%). The highest percentage of liver fascioliasis was record in cattle especially in June (2.30%) followed by sheep in March (0.98%) but the goat had no infection throughout the year. The highest percentage of lung hydatid cyst was record in sheep followed by cattle especially in November (17.54 and 10.17%) respectively, followed by goat in September (0.22%). These records was continue for pneumonia, as highest percentage was recorded in sheep then cattle in October (19.71 and 10.22%) followed by goat in February (2.38%).

Keywords: Fashiola, hydatid cyst, livestock, pneumonia

Introduction

Iraqi Kurdistan represent a great source of sheep, goats and cattle, which they are an important part of the national economy. The livers and lungs are the most susceptible organs to different aggressions because of their anatomical and histological particularities. The deterioration of the hygienic conditions is the most important factors that aggravate and promote pulmonary diseases [1, 2].

Hydatid cyst is a parasitic disease caused by *Echinococcus granulosus*, a cestode which remains endemic in some parts of the world [3]. Fascioliasis is caused by *Fasciola hepatica*, widely distributed in Iraq, and presents in all parts of the country [4]. On the other hand pneumonia is a common disease of domestic animals, age, geographic location, nutrition and climate are determining factors for type of infection causing pneumonia. In addition, rearing systems, stress factors, climatic changes, unhygienic conditions, sudden changes in feed and a low level of herd health status are stated as predisposing factors to bacteria and viruses [2]. Severe lung lesions could lead to greatly decreased growth performance of the animals [5].

In Iraq many studies were conducted about livestock liver and lung infections like in Erbil, Al-Najaf, Kirkuk and Baghdad [6, 7, 8, 9].

In Kurdistan, we have very little precise statistics on livestock's liver and lung infections, and no deepened survey has been led on their epidemiology, and because of the important economic impact on sheep, goats and cattle, the present study aimed to show the prevalence of hydatid cysts in liver and lung, necrosis, fascioliasis and pneumonia in these studying animals.

Material and methods

Geographical situation

The survey has been led in Koya's slaughter house in the east of Erbil governorate.

Ruminant animals

The investigation has been done from the beginning of January 2013 to end of December 2013 on 15919 animals including 5880 sheep, 4159 goats and 5880 cattle of different ages and sexes. These animals are local breeds and generally originated from Pshdar, Dashty Koya, Dashty Hawler provenance and some came from Iran. For every animal, the organs examination has been achieved by naked eye on all carcasses and more in details on the visceral organs and a deep observation by incision on liver and lung. Infections with hydatid cyst in liver and lung, liver necrosis, fascioliasis and pneumonia was recorded, as well as seasonal distribution was studied [2].

Statistical analysis

The data was analyzed using Chi- square analysis (χ^2), the test was used to find the variation prevalence during the period of study [10].

Results

The results in table 1 shows that the number of sheep, goats and cattle slaughtered in Koya abattoir in year 2013 were 5580, 4159 and 7996 respectively. It is also shows that the number of ruminants slaughtered varies in different seasons. The number of sheep slaughtered was highest in spring followed by summer, winter and autumn, while the number of goats slaughtered was lower than sheep except summer which record the highest slaughtered number followed by autumn, spring and winter. The slaughtered cattle was the highest in autumn followed by summer, spring and winter.

The statistical analysis results in table 2 shows height significant differences ($P < 0.01$) between different months and also between different infections in liver in both sheep and cattle, while the differences were not significant in goats. The highest percentage of hydatid cyst (Figure 1) was record in sheep especially in February (6.54%) followed by cattle in March

(2.17%) and goat in September (0.22%). The highest percentage of liver necrosis was record in sheep especially in October (3.43%) followed by cattle in June (1.46%) and goat in July (0.26%). The highest percentage of liver fascioliasis (Figure 2. a) was record in cattle especially in June (2.30%) followed by sheep in March (0.98%) and goat had no infection throughout the year.

Results in table 3 shows height significant differences ($P < 0.01$) between different months and also between different infections in lung of sheep, goats and cattle. The highest percentage of hydatid cyst was record in sheep then cattle especially in November (17.54 and 10.17%) respectively followed by goat in September (0.22%). This arrangement was continue regarding to pneumonia (Figure 2.b), the highest percentage was record in sheep then cattle in October (19.71 and 10.22%) followed by goat in February (2.38%).

Results in table 4 shows the distribution of liver hydatid cysts, necrosis, fascioliasis, lung hydatid cysts and pneumonia infections in winter, spring, summer and autumn respectively, and there were height significant differences ($P < 0.01$) between different animals (sheep, goats and cattle) and also between the different infections in liver and lung.

It's clear in table 4 results that in winter, sheep recorded the highest percentage (4.79, 0.52, 9.06 and 18.04%) for liver hydatid cysts, necrosis, lung hydatid cysts and pneumonia infections respectively. While goats recorded null infection for liver hydatid cysts, necrosis, fascioliasis, lung hydatid cysts and lowest pneumonia infection (0.70%).

Table 4 shows that in spring sheep recorded the highest percentage of liver and lung hydatid cysts and pneumonia infections (2, 13, 6.46 and 13.61%) respectively, but cattle record the highest percentage

(0.74 and 1.34%) for liver necrosis and fascioliasis. In spring goats also recorded null infection for liver hydatid cysts, necrosis, fascioliasis and lung hydatid cysts, whereas it records the lowest pneumonia infection (0.46%).

In summer (table 4) sheep also recorded the highest percentage of liver hydatid cysts, liver necrosis, lung hydatid cysts and pneumonia infections (2.64, 1.57, 4.41 and 12.15%) respectively, but cattle record the highest percentage (1.59%) for liver fascioliasis infection. In summer goats recorded the lowest infection (0.05, 0.14, 0, 0 and 0.34%) for liver hydatid cysts, necrosis, fascioliasis, lung hydatid cysts and pneumonia infections respectively.

The results in table 4 shows in autumn season the sheep recorded the highest percentage of liver hydatid cysts, necrosis, lung hydatid cysts and pneumonia infections (4.61, 1.84, 9.72 and 13.83%) respectively, but cattle record the highest percentage for liver fascioliasis infection (0.60%). Goats recorded the lowest infection (0.10, 0, 0, 0.10 and 0.33%) for liver hydatid cysts, necrosis, fascioliasis, lung hydatid cysts and pneumonia infections respectively.

The results in table 5 shows the percentage of liver and lung infections during the period of study, and it shows height significant differences ($P < 0.01$) between different animals, liver infections, and also between lung infections. Sheep recorded the highest percentage of liver hydatid cysts, necrosis, lung hydatid cysts and pneumonia infections (4.10, 1.23, 8.66 and 9.88%) respectively, but cattle record the highest percentage for liver fascioliasis infection (1.80%). Goats recorded the lowest infection (0.06, 0.09, 0, 0.06 and 0.45%) during the year for liver hydatid cysts, necrosis, fascioliasis, lung hydatid cysts and pneumonia infections respectively.

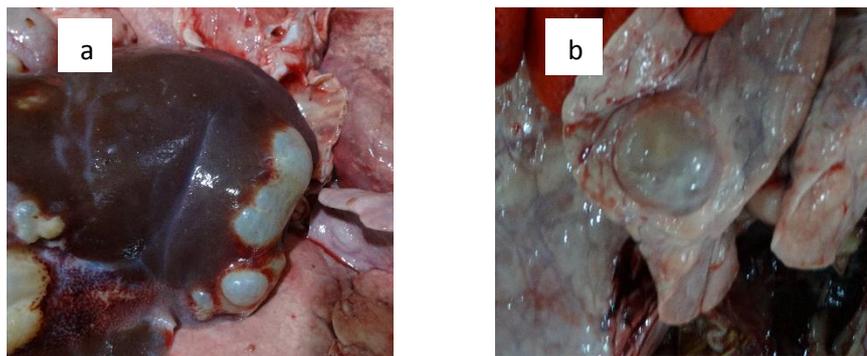


Figure (1): Images of infection with a) liver hydatid cysts b) lung hydatid cysts

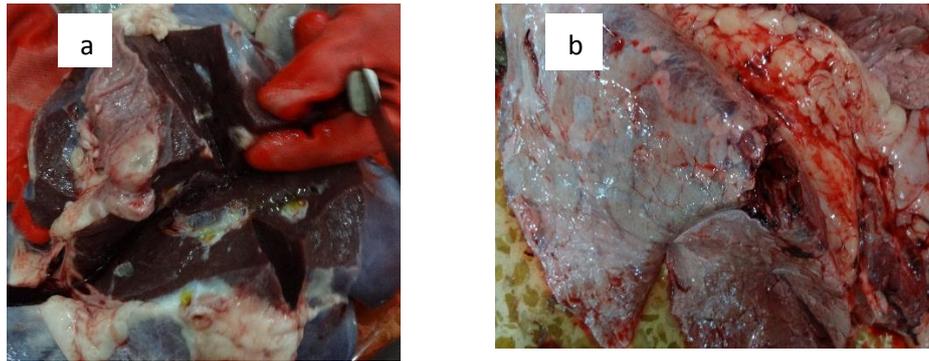


Figure (2): Images of infection with a) liver fascioliasis b) lung pneumonia

Discussion

The results of this study showed that cattle are the most common ruminants slaughtered in Koya slaughter house, followed by sheep and goats, this reflects that people in Koya prefer cattle meat than other animals, and this may be due to that the cattle meat sold without bone. The highest number of sheep slaughtered in spring season may be related to season of parturition of sheep and preference of people to young fresh meat, as lamb's meat during picnics in spring season.

The occurrence of different infections in an area is influenced by multifactor system which comprises hosts, parasitic, environmental effects and physical and psychological stressors which capable of altering immune function in animals [8, 11]. The rate of liver and lung hydatid cysts in this study were 4.10 and 8.66% in sheep and 1.18 and 5.87% in cattle which was lower than those reported by [6] in Arbil province whom found 27.4% of goats and 22.3% of cattle were infected with hydatid cysts. The results was also less than the results of [12] in Basrah who found that rate of hydatid cyst in lung was 47.01 , 52.72% in sheep and cattle respectively, while in liver it was 52.9 and 65.4% for sheep and cattle respectively.

The different infection rate in different provinces might be related to geographical distribution, period of study and sample size. No hydatid cysts were observed among slaughtered goats, except one infection in animal liver in each of June and September and one infection in animal lung in September, this may be due to goats are more resistant to hydatidosis than other animals or because they slaughtered mostly in their 1st year age, or may be that due to the grazing of goats are natural browsers, preferring to eat leaves, twigs, vines, and shrubs. Goats like to eat the tops of plants. Sheep are grazers, preferring to eat short, tender grasses and they like to graze close to the soil surfaces which snails are present in, which is intermediate host for fasciola.

Regarding the distribution of liver and lung infections in Koya province, it is found that the rate of liver

flukes was highest in cattle (1.80%), followed by sheep (0.14%) and goats (0.00%). The highest rate of liver flukes in this study among cattle might be due to most sheep and goats are slaughtered in early age compared to cattle. The distribution of infection was lower than that reported by [9] who found the rate of infection in cattle and sheep in Baghdad was 27% and 7.1% respectively. Also [13] found the rate of liver flukes in cattle, sheep and goats were 2.63%, 0.50% and 0.43% respectively. The lower rate of fascioliasis in this study compared to other studies conducted in Iraq might be due to low rates of snails in Koya and animal sources area.

Regarding the distribution of infections according to seasons, it is shown that the infection of liver and lung hydatid cysts, liver necrosis and flukes and pneumonia were distributed during all seasons, especially in sheep and cattle with their rate being high during winter and autumn months. Whereas [12] found that high infection rate with hydatid cyst in sheep, cattle was in spring (3.3 and 5.4%) respectively, while infection rate with fascioliasis was high in sheep (3.2%) in winter. In Sulaimania slaughter-house founded that the highest rate was in November [14]. The differences between our results and others might be related to differences in geographical distribution variation in environmental conditions, sample size and period of study [8].

In general the low rate of infection with hydatidosis in Koya animals compared to other and surrounding province in the last year may be due to irradiation programs for stray dogs by Strychnine, restricted of slaughter animals outside the abattoirs and increase hygienic condition in the abattoirs represented with condemnation infected organs. Also the low infections may be due to intense veterinary prophylaxis program for liver fluke in the last years [12, 15].

It is recommended:

- 1- Healthy deal with the slaughterhouse wastes.
- 2- Treating with the stray dogs by affected methods, and using vaccines against hydatid cyst in sheep.
- 3- Establish diagnostic laboratory in each slaughter house.

Table 1. The number of ruminants slaughtered in Koya abattoir during 2013

Month	Sheep	Goat	Cattle	Total
December	346	143	404	893
January	553	99	528	1180
February	459	42	453	954
Total (Winter)	1358	284	1385	3027
March	410	53	506	969
April	657	224	498	1379
May	674	599	486	1759
Total (Spring)	1741	876	1490	4107
June	530	690	478	1698
July	482	769	523	1774
August	576	617	632	1825
Total (Summer)	1588	2076	1633	5297
September	518	445	539	1502
October	350	304	489	1143
November	325	174	344	843
Total (Autumn)	1193	923	1372	3488
Overall total	5880	4159	5880	15919

Table 2. The percentage of infections in slaughtered animal's liver during 2013.

Month	Sheep						Goat						Cattle					
	H	%	N	%	F	%	H	%	N	%	F	%	H	%	N	%	F	%
January	19	3.44	0	0	0	0	0	0	0	0	0	0	4	0.76	7	1.33	12	2.27
February	30	6.54	5	1.09	0	0	0	0	0	0	0	0	3	0.66	4	0.88	4	0.88
March	11	2.68	3	0.73	4	0.98	0	0	0	0	0	0	11	2.17	0	0	9	1.78
April	15	2.28	2	0.30	0	0	0	0	0	0	0	0	6	1.20	5	1.00	6	1.20
May	11	1.63	1	0.15	0	0	0	0	0	0	0	0	9	1.85	6	1.23	5	1.03
June	13	2.45	9	1.7	2	0.38	0	0	1	0.14	0	0	1	0.21	7	1.46	11	2.30
July	15	3.11	6	1.24	0	0	1	0.13	2	0.26	0	0	3	0.57	7	1.34	9	1.72
August	14	2.43	10	1.74	1	0.17	0	0	0	0	0	0	4	0.63	6	0.95	6	0.95
September	22	4.25	5	0.97	0	0	1	0.22	0	0	0	0	4	0.74	7	1.30	6	1.11
October	21	6.00	12	3.43	0	0	0	0	0	0	0	0	2	0.41	6	1.23	5	1.02
November	12	3.69	5	1.54	0	0	0	0	0	0	0	0	4	1.16	1	0.29	3	0.87
December	16	4.62	2	0.58	0	0	0	0	0	0	0	0	5	1.24	0	0	9	2.23
Chi-Sq. ^(X²)	933.10						10.00						706.69					
P value	P<0.01						P= 0.125 (N.S)						P<0.01					

H= hydatid cysts, N= necrosis, F=fascioliasis

Table 3. The percentage of infections in slaughtered animals' lung during 2013

Month	Sheep				Goat				Cattle			
	H	%	P	%	H	%	P	%	H	%	P	%
January	25	4.52	119	21.52	0	0	1	1.01	18	3.41	48	9.09
February	52	11.33	81	17.65	0	0	1	2.38	22	4.86	30	6.62
March	61	14.88	46	11.22	0	0	0	0	28	5.53	13	2.57
April	35	5.33	102	15.53	0	0	2	0.89	34	6.83	37	7.43
May	16	2.34	89	13.20	0	0	2	0.33	25	5.14	34	7.00
June	18	3.40	55	10.38	0	0	3	0.43	26	5.44	42	8.79
July	26	5.39	60	12.45	0	0	4	0.52	28	5.35	26	4.97
August	26	4.51	78	13.54	0	0	0	0	0	0	0	0
September	30	5.79	96	18.53	1	0.22	2	0.45	14	2.60	51	9.46
October	29	8.29	69	19.71	0	0	1	0.33	31	6.34	50	10.22
November	57	17.54	0	0	0	0	0	0	35	10.17	0	0
December	46	13.29	45	13.01	0	0	0	0	32	7.92	17	4.21
Chi-Sq. ^(X²)	7431.16				85.00				3651.71			
P value	P<0.01				P<0.01				P<0.01			

H= hydatid cysts, P= pneumonia

Table 4. Distribution of liver hydatid cysts, necrosis , fascioliasis , lung hydatid cysts and pneumonia infections in winter, spring, summer and autumn.

Animal	Liver			Lung	
Animal	H	N	F	H	P
Winter					
Sheep No.	65	7	0	123	245
%	4.79	0.52	0	9.06	18.04
Goats No	0	0	0	0	2
%	0	0	0	0	0.70
Cattle No	12	11	25	72	95
%	0.47	0.43	0.99	2.84	3.74
Chi-Sq. ^(x2)	273.76				
P value	P<0.01				
Spring					
Sheep No.	37	6	4	112	237
%	2.13	0.34	0.23	6.46	13.61
Goats No	0	0	0	0	4
%	0	0	0	0	0.46
Cattle No	26	11	20	87	84
%	1.74	0.74	1.34	5.84	5.64
Chi-Sq. ^(x2)	209.59				
P value	P<0.01				
Summer					
Sheep No.	42	25	3	70	193
%	2.64	1.57	0.19	4.41	12.15
Goats No	1	3	0	0	7
%	0.05	0.14	0	0	0.34
Cattle No	8	20	26	54	68
%	0.49	1.22	1.59	3.31	4.16
Chi-Sq. ^(x2)	212.76				
P value	P<0.01				
Autumn					
Sheep No.	55	22	0	116	165
%	4.61	1.84	0	9.72	13.83
Goats No	1	0	0	1	3
%	0.10	0	0	0.10	0.33
Cattle No	10	14	14	80	101
%	0.43	0.60	0.60	3.43	4.33
Chi-Sq. ^(x2)	266.51				
P value	P<0.01				

H= hydatid cysts, N= necrosis, F=fascioliasis, P= pneumonia

Table 5. Incidence of liver hydatid cysts, necrosis , fascioliasis , lung hydatid cysts and pneumonia infections among slaughtered ruminant in Koya abattoir in 2013

Animals	Overall total	Liver						Lung			
		Total infection slaughtered									
		H	%	N	%	F	%	H	%	P	%
Sheep	4859	199	4.10	60	1.23	7	0.14	421	8.66	840	9.88
Goats	3538	2	0.06	3	0.09	0	0	2	0.06	16	0.45
Cattle	4733	56	1.18	56	1.18	85	1.80	278	5.87	348	7.35
Chi-Sq. ^(x2)		143.96						987.70			
P value		P<0.01						P<0.01			

H= hydatid cysts, N= necrosis, F=fascioliasis, P= pneumonia

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انتشار بعض إصابات الكبد والرئة في ذبائح مجزرة كويسنجق، أربيل، العراق

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الملخص

أجريت هذه الدراسة في مجزرة قضاء كويسنجق التابعة لمحافظة أربيل خلال سنة 2013 لغرض التحري عن الأكياس المائية في الكبد والرئة والتنخر وديدان الكبد والتهاب الرئة في 15919 من الحيوانات المذبوحة والتي تضمنت 5880 غنماً و 4159 ماعزاً و 5880 بقرة. أظهرت النتائج وجود فروق عالية معنوية بين أشهر السنة المختلفة في عدد الحيوانات المذبوحة وكذلك بين إصابات الكبد المختلفة في الأغنام والأبقار، في حين لم تكن الفروق معنوية بالنسبة لإصابات كبد الماعز، وقد كانت الفروق معنوية بين إصابات الرئة في كل من الأغنام والأبقار والماعز. كانت أعلى نسبة مئوية لإصابة الكبد بالأكياس المائية في الأغنام وخاصة في شهر شباط (6,54%) تبعه كل من الأبقار في شهر آذار (2,17%) ثم الماعز بنسبة (0,22%). سجلت أعلى نسبة مئوية للإصابة بتنخر الكبد في الأغنام خصوصاً في شهر تشرين الأول (3,43%) تبعه الأبقار في شهر حزيران بنسبة (1,46%) ثم الماعز (0,26%). سجلت أعلى نسبة مئوية للإصابة بديدان الكبد في الأبقار خصوصاً في شهر حزيران (2,30%) تبعه كل من الأغنام في شهر آذار (0,98%) ثم الماعز الذي لم يسجل أية إصابة خلال مدة الدراسة التي بلغت سنة كاملة. أعلى نسبة مئوية لإصابة الرئة بالأكياس المائية سجلت في الأغنام ثم الأبقار خلال شهر تشرين الثاني وبلغت 17,54 و 10,17% على التوالي واتبعتها الماعز بنسبة 0,33% في شهر أيلول، واستمر هذا الترتيب بالنسبة للإصابة بالتهاب الرئة، إذ سجلت أعلى نسبة مئوية للإصابة في الأغنام ثم الأبقار خلال شهر تشرين الثاني وبلغت 19,71 و 10,22% على التوالي واتبعتها الماعز بنسبة 2,38% خلال شهر شباط.

كلمات مفتاحية: ديدان الكبد، أكياس مائية، ماشية، التهاب الرئة.