



STUDY OF BOVINE AND OVINE PULMONARY AND HEPATIC ABSCESSATION AT KIRKUK ABATTOIR

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Abstract

The study was conducted from first of July 2018 until end of March 2019. Animal slaughters were examined macroscopically to determine the hepatic and pulmonary abscess in slaughtered animals. The animals were slaughtered during study period were 26,129 sheep, 2,178 goat, 9,823 cattle and 174 buffalo. Rate of liver abscess was observed in sheep 0.26%, goat 1.04%, cattle 1.16% and buffalo 12.5percentage. Pulmonary abscess was in Sheep 0.32%, Goat 1.16%, Cattle 1, 11%, Buffalo 11.01%. hydatid cysts in liver was in Sheep 0.26%, Goat 0.61%, Cattle 0.93%, Buffalo 5.02% and in lung was in Sheep 0.25%, Goat 0.54%, Cattle 0.98%, Buffalo 4.89%. Liver fluke percentage was in Sheep 0.17%, Goat 0.7%, Cattle 1.23% and buffalo 12.98%. Generally level of Pulmonary and lung abscess, hydatid cysts and flukes was increased in spring and winter and decreased in summer and autumn.

Keywords: Bovine; Ovine; Pulmonary; Hepatic; Abscess; Kirkuk

Introduction

Slaughter houses are very important for detecting diseases of both economic and public health importance and its regulations, represents a key control point of livestock production chain (Raji *et al.*, 2010). As such problems concerning meat hygiene and possible health risks to the consumer should be documented during both antemortem and post-mortem examination. In this context, meat-inspection data are a potential source of information and have an important role to play in epidemiology and preventive veterinary medicine (Salem *et al.*, 2011). The humans and animals are suspected to suffering from lung and hepatic abscess which caused by microbial infection (*Mycobacterium tuberculosis*, *Streptococcus pyogenes*, *Staphylococcus aureus*, *Klebsiella pseudomonas*, *proteus* and *Entamoeba histolytica*) (Web, 2014). *Fusobacterium necrophorum* a gram- negative, rod-shaped and an aero tolerant anaerobe, is a normal inhabitant of the rumen of cattle. The organism is in ruminal contents and adherent to the ruminal wall. The ruminal concentration is higher in grain-fed than forage-fed cattle (Tan *et al.*, 1996), from the rumen, the organism gains entry into the portal circulation and is trapped in the liver to cause abscesses, the organism is an opportunistic pathogen and a primary causative agent of liver abscesses. Amoebic liver abscess due to *Entamoeba histolytica* accounts for 10% of cases.

The incidence is much higher in developing countries. Fungal abscess, most often due to *Candida* species, accounts for less than 10% of cases (Asseged *et al.*, 2004). Liver abscesses are often secondary to ruminal acidosis and ruminitis in grain-fed cattle .the occurrence of a liver abscesses in feedlot cattle is associated with negative performance and economic impacts .classically the primary etiology of this disease is attributed to *Fusobacterium necrophorum*. The liver disease are reflected by gross and histopathological changes involving size, shape, color, texture and continuity due to inflammation, degeneration which may be congenital ,nutritional, vascular or neoplastic (Tan *et al.*, 1996; Asseged *et al.*, 2004). While the respiratory system is an important system of animal which connecting directly with external environment, pneumonia (of different

type), pulmonary abscess, pleurisy (adhesion), emphysema, hydrothorax, empyema, pulmonary tuberculosis, melanosis and parasitic infestation such cyst cercus tenuicollis, hiatal cysts, *Fasciola hepatica*, *Dicrocoelium dertriticum* are the main pulmonary pathology which are responsible for abscess formation of the bovine and ovine (Awah *et al.* , 2007). So there is different type of disease that affected lungs and liver that lead to inflammations of lung which may appear as a nodular reaction ,and inflammation of liver which known as (hepatitis)may acute or chronic (Awah *et al.*, 2007; Piedrafita *et al.*, 2010), and finally cause economic losses for bovine and ovine slaughtered in Kirkuk city.

Parasite infection such as *Fascioliasis* and Hydatid cysts usually lead to lesions and abscess in lung and liver by secondary infection, so that the study of averages of parasite infection of liver and lung important (Khalil, 2010). The morbidity of hydatidosis in Al-Najaf slaughterhouse in 2009 was 13.53% (3789 animal from 117908) among the whole slaughtered animals with a value of, 3.6 % in buffalo 4.4% in cattle 4.18 % in sheep (Khalil, 2010). While in another study in the liver of sheep in abattoir of Kirkuk province during May 2010 the percentage of hepatic lesions which are 20.9%, and the prevalence of parasitic infection and hepatitis are 26.3%, 22.3% respectively (Tan *et al.*, 196). *Fascioliasis* is widespread disease in Iraq and it is found in all parts of the country (Abass *et al.*, 2018).

In AL-Sheikh Omer slaughter house, (Al-Barwari, 1978) found that the rate of *Fascioliasis* was cattle 27% and Sheep 7.1%, and In Basra (Al-Barwari, 1978; Abass *et al.*, 2018), reported that the rate of infection in sheep 0.7% and cattle 3.2 %. While in Babylon found that the rate of infection in cattle with *Fasciola gigantica* was 19.3%. The highest rate was in summer 25.5% (Abass *et al.*, 2018). In Kirkuk slaughter house in 2012, the rate of hydatid cysts. In sheep was 0.77%, liver flukes 0.36%, lung worms 0.19%, and pneumonia 0.58%, the highest rate was in summer 0.74% while hepatitis was 0.32%, the highest was in winter 0.42 % (Kadir *et al.*, 2012).

Materials and Methods

Study area

This study is a reviewing survey, carried out from 1 July 2018 to 30 March 2019. It investigated records of daily condemnation for sheep, cattle, goats and buffaloes in the biggest slaughterhouse (Aleasria) in Kirkuk (East province, north of Iraq). Economy of the city is based on agriculture, that most people around Kirkuk are farmers. The city is famous for being the Food Basket of the Nation (Iraq) due to its various rich agricultural productions, including corn, wheat, barley, tomatoes etc. Overhead 7% of population are involved in arable areas (Abass *et al.*, 2019). Scientific committee at Veterinary Medicine College/ Kirkuk University (Iraq) has approved this work.

Sample collection and animal selection

The study was conducted on different animals (sheep, goat, cattle, and buffaloes) in Aleasria slaughterhouse, situated at the south east part of Kirkuk. This slaughterhouse contains two main halls: one is for sheep accommodating up to (26,129) slaughtered sheep; while the other one is for cattle accommodating up to (9,823) slaughtered cattle; besides, it has two rooms for slaughtered goats and buffaloes (2,178 and 174), respectively. Additionally, there is a room for authorities of veterinary and another room for changing wears. All animals were from north of Iraq with local origin and slaughtered according to the Islamic way. The abattoir under study sourced its sheep and cattle mostly from neighboring cities, such as Tikrit, Mosul, Sulaymaniyah, adding to Northern cities in the country. Whereas the source of most goats was from Kirkuk, buffaloes were from south of Iraq (Shamsul-Islam, 1982; Kadir and Rashed 2008; Abass *et al.*, 2019).

Statistical Analysis

A monthly basis was employed to organize the incidence. A software called Sigma Plot (version 12) was used to analyses the data. Special calculation forms were used to record the data. Microsoft® Excel (2018) was used to conduct the initial analysis (Abass Askar *et al.*, 2011).

Results

The results of our work studied the total number of slaughtered animals from beginning of study at 1 July 2018 until 30 March 2019 were (26,129) Sheep, 2,178 Goat, 9823 Cattle and 174 Buffalo. Table 1. display the number of slaughtered Sheep in each month during study period with percentages of each observed lesion in lung and liver. Slaughtered Sheep are 26,129 in total, rate of infected animals 1,46% from total slaughtered sheep. The number of

affected Sheep with pulmonary and hepatic lesion. Lung abscess record top level at spring March 2019 and was high in end of summer July 2018, Lung abscess begin to decrease in autumn and winter to arrive to bottom level at January 2019 (Table 1). Liver abscess levels was similar to levels of lung abscess, where it high in end of summer and spring while very slightly level during winter. Hydatid cysts in liver and lung were medium level in summer and autumn but, sharply increased in October 2018 and return to low with next months (Table 1). Liver worms record high levels in summer and autumn and decrease in winter.

Table 2 have data of number of slaughtered cattle and percentages of affection of liver and lung during study from total slaughtered cattle, 9823 Cattle slaughtered from 1 July 2018 until 30 March 2019. The rate of infected animals was 6.45% and it increased in March 2019 when ranged in 0.79%-2.44%. In Table 2. we showing the level of lesion of lung and liver in cattle, the lesions generally have low levels in summer and autumn and begin increase with winter October 2018 to arrive top levels in spring March 2019 except hydatid cysts which have top level in winter January 2019. Liver and lung abscess levels showing high relationship with liver worms level so they increase together to riches top level at spring March 2019 approximately 40 case in this month.

Table 3 have the data of Goat, it show the number of slaughtered Goats and rate of infected of liver and lung. 2,178 Goats are slaughtered little than Sheep and Cattle, so that it will show low rate of infected in comparative with sheep and cattle. (5.32%) of slaughtered animals were infected. Most affection recorded in March 2019 when rich to 0.72% 4.30% from 279 slaughtered animal. In the Table 3 we showing the level of observed lesion in lung and liver goat. Commonly, the levels of affections are low during study period except at spring March 2019 there are sharply increase in number of affection by lung abscess, liver abscess and liver worms. This other signs of relationship between liver worms and abscess forming in lung and liver.

Table 4 expression the number of slaughtered Buffalo and rate of infected of liver and lung. Number of slaughtered Buffalo are very little in comparative with other species due to lack of buffalo breeding in Kirkuk also rarely consumption of its meat by Kirkuk peoples. We showing in the levels of affections of lung and liver of buffalo during study period. Generally, the levels of affections are low during this period except in spring March 2019 when there are very high level of affection by lung and liver abscess with liver fluke infestation. Hydatid cysts generally rarely case in buffalo and in some month absents. But, show some cases in January and March 2019.

Table 1 : Pathological lesions and number of slaughtered sheep and percentages of observed at Kirkuk abattoir.

Month	Sample size	Liver abscess		Lungs abscess		Hydatid cyst in liver		Hydatid cyst in lungs		Liver worms	
		N	%	N	%	N	%	N	%	N	%
July 2018	4806	18	0.37%	20	0.42%	13	0.27%	13	0.27%	14	0.29%
August 2018	4794	19	0.40%	15	0.31%	12	0.25%	12	0.25%	16	0.33%
September 2018	4918	16	0.33%	12	0.24%	8	0.16%	8	0.16%	17	0.35%
October 2018	4418	12	0.27%	11	0.25%	23	0.52%	18	0.41%	5	0.11%
November 2018	4566	3	0.07%	13	0.28%	8	0.18%	8	0.18%	6	0.13%
December 2018	4880	4	0.08%	14	0.29%	8	0.16%	7	0.14%	8	0.16%
January 2019	4220	7	0.17%	10	0.24%	12	0.28%	11	0.26%	5	0.12%
February 2019	4048	8	0.20%	12	0.30%	10	0.25%	10	0.25%	6	0.15%
March 2019	3997	18	0.45%	24	0.60%	12	0.30%	12	0.30%	8	0.20%

Table 2 : Pathological lesions and number of slaughtered cattle and percentages of affection of liver and lung at Kirkuk abattoir

Month	Sample size	Liver abscess		Lungs abscess		Hydatid cyst in liver		Hydatid cyst in lungs		Liver worms	
		N	%	N	%	N	%	N	%	N	%
July 2018	1370	12	0.88%	9	0.66%	10	0.73%	10	0.73%	9	0.66%
August 2018	1361	11	0.81%	9	0.66%	10	0.73%	10	0.73%	10	0.73%
September 2018	1401	12	0.86%	13	0.93%	7	0.50%	7	0.50%	11	0.79%
October 2018	1375	19	1.38%	8	0.58%	18	1.31%	25	1.82%	22	1.60%
November 2018	1588	14	0.88%	17	1.07%	16	1.01%	16	1.01%	16	1.01%
December 2018	1840	13	0.71%	18	0.98%	17	0.92%	16	0.87%	16	0.87%
January 2019	1683	22	1.31%	21	1.25%	23	1.37%	25	1.49%	20	1.19%
February 2019	1697	20	1.18%	28	1.65%	16	0.94%	16	0.94%	32	1.89%
March 2019	1640	40	2.44%	36	2.20%	13	0.79%	13	0.79%	38	2.32%

Table 3 : Pathological lesions and number of slaughtered goat and percentages of affection of liver and lung at Kirkuk abattoir

Month	Sample size	Liver abscess		Lungs abscess		Hydatid cyst in liver		Hydatid cyst in lungs		Liver worms	
		N	%	N	%	N	%	N	%	N	%
July 2018	470	6	1.28%	5	1.06%	2	0.43%	2	0.43%	4	0.85%
August 2018	474	5	1.05%	3	0.63%	4	0.84%	4	0.84%	3	0.63%
September 2018	480	3	0.63%	5	1.04%	2	0.42%	2	0.42%	4	0.83%
October 2018	465	3	0.65%	3	0.65%	4	0.86%	2	0.43%	2	0.43%
November 2018	449	0	0.00%	3	0.67%	2	0.45%	2	0.45%	2	0.45%
December 2018	410	2	0.49%	3	0.73%	3	0.73%	2	0.49%	3	0.73%
January 2019	286	4	1.40%	2	0.70%	3	1.05%	1	0.35%	3	1.05%
February 2019	289	2	0.69%	2	0.69%	0	0.00%	2	0.69%	0	0.00%
March 2019	279	9	3.23%	12	4.30%	2	0.72%	2	0.72%	6	2.15%

Table 4 : Pathological lesions and number of slaughtered buffalo and percentages of affection of liver and lung at Kirkuk abattoir.

Month	Sample size	Liver abscess		Lungs abscess		Hydatid cyst in liver		Hydatid cyst in lungs		Liver worms	
		N	%	N	%	N	%	N	%	N	%
July 2018	17	5	29.41%	3	17.65%	0	0.00%	0	0.00%	2	11.76%
August 2018	19	2	10.53%	1	5.26%	0	0.00%	0	0.00%	3	15.79%
September 2018	16	3	18.75%	2	12.50%	0	0.00%	0	0.00%	4	25.00%
October 2018	17	0	0.00%	0	0.00%	1	5.88%	1	5.88%	1	5.88%
November 2018	25	2	8.00%	2	8.00%	0	0.00%	2	8.00%	0	0.00%
December 2018	32	2	6.25%	4	12.50%	2	6.25%	0	0.00%	0	0.00%
January 2019	34	2	5.88%	1	2.94%	5	14.71%	4	11.76%	3	8.82%
February 2019	34	1	2.94%	2	5.88%	2	5.88%	2	5.88%	2	5.88%
March 2019	32	10	31.25%	11	34.38%	4	12.50%	4	12.50%	14	43.75%

Discussion

The findings of this study revealed that condemnation of liver and lungs due to parasitic infestation and pathological lesions was frequently recorded in sheep, goat, cattle and buffalo slaughtered at Kirkuk slaughterhouse. The common parasite infestation observed was *Fasciola* spp. and *Echinococcus* which cause Hydatid cysts. This type of parasite also infected the human and infected meat is one of the method of transmission to human. The public health is the target of this research study (Abass *et al.*, 2018). Furthermore, these affections cause economic losses where they decrease milk production and loss of meat weight (*et al.*, 2019).

On the other hand, showing high relation shape between parasite infestation and abscess formation where in months and seasons that there are increase in infection of

liver fluke there are increase in abscess forming due to bacterial activity. Table 1 show the rate of lung abscess in sheep which was 0.32%, it was in top rate at spring March 2019 when rich 0.60%. A study in Karbala slaughter house show 0.54% of lung abscess in sheep 15% (Hikmat Sahib Al-Nassir, 2012), the high rate of them study may be due to high number of slaughtered sheep, where they slaughtered more than 94106 Sheep. Liver abscess in sheep was 0.26% and have highest rate at spring March 2019 rich to 0.45%, and decrease in winter December 2018 to 0.07%. Hydatid cysts in sheep was generally highest than other species, in summer and autumn was 0.22% and in spring 0.30%, winter 0.27%. The study in Najaf showed the rate of Hydatid cysts in winter was 1.09%, summer 0.60% (Khalil, 2010). This may be due to different in geographical distribution variation in environmental conditions. Liver fluke in sheep are high in

summer 0.32% and low in winter 0.13% and return to increase in spring to rich 20%. In Babylon Al-Delimi (2005) found the highest rate in summer and lowest in winter months. Table 2 show data of affection in cattle. liver abscess 1.16%, its highest in spring than in sheep, where it was rich to 2.44%. In study of Kufa Journal For Veterinary Medical Sciences observed the rate of Hepatic abscess in spring was 1.54% (Khalil, 2010). Lung abscess in cattle was 1.11%, It is increased in winter to rich 1.65% in February 2018 and record top rate at spring March 2019. Pneumonia are commonest in spring and summer due to change of weather (Abass *et al.*, 2019). Hydatid cysts in cattle are more than in other species, 0.93% is the rate of hydatid cysts, it increase in winter to rich 1.82% in November 2018. In Iran (Salem *et al.*, 2011) recorded the prevalence of sheep liver hydatid cysts at the municipal slaughterhouse of Tabriz, northern region of Iran was 23.57%. Liver fluke rate in cattle was 1.23%, Increased in winter 1.42% and spring 2.32% and decreased in summer 0.72%. The study (13) in Kirkuk at 2005 the rate of liver fluke in cattle was 1.57%.

In (Table 3) show the data of goats that slaughtered and affected with pulmonary and hepatic lesions. Pulmonary abscess rate was 1.16%, Observed abscess in lung were increased sharply in spring March 2019, when rich 4.30% while show lower rate in August 2018 decrease to 0.63%. In Karbala slaughterhouse observed 0.14% of slaughtered gats were infected in lung by abscess (16). This difference due to low breeding of goat in south of Iraq and low consumption of goat's meat by Karbala people, where they slaughtered 729 goats (19). Hepatic abscess was 1.04%, in spring March 2019 record highest level when rich 4.30%. Hydatid cysts generally medium in rate which was 0.49%. Liver fluke rate in goat was 0.79% and such as other species rich to top rate in March 2019 when recorded 2.15%.

Liver abscess rate 12.56%, lung abscess 11.01%, Hydatid cysts 5.04%, Liver fluke 12.98% (Table 4). The buffalo showed highest level of affection than other species, this coming from several causes such as the owners not slaughtered buffalo before rich old age, buffalo in Kirkuk mostly grazing from dumps which may be contaminated with any type of disease, street dogs which most of it carrier of Hydatid cysts and have direct contacts with buffalo live in Kirkuk and buffalo live in swamps of water which rich of snails the intermediate host of liver fluke (15).

Generally in all species noted the level of disease were increased in spring and autumn when the weather begin changed. Specially in spring the level of all disease increased, this result from increase humidity of ground with increase in weather temperature lead to activity of most species of pathogenic microorganisms (Bacteria, Mycoplasma and fungus) also stimulate to activity of parasites, furthermore common domestic animals owners late the animals grazing from free ground.

Liver fluke and hydatid cysts commonly lead to secondary infection in lung an liver, In Karbala abattoirs were frequently condemned due to pneumonia (0.66%), followed by hydatid cysts (0.51%) and lung worms (0.44%), and that pneumonia represented the main notifiable disease behind rejection and disposal of affected lungs during inspection of carcasses and their offal. The high condemnation rate of ruminant- lungs due to pneumonia may be attributed to the absence of hygienic roles applied in

management of these animals as well as to the predisposing factors such as migration of internal parasites which pave the way for secondary infection (16). In Kirkuk the rate of liver fluke in sheep was highest in summer 0.43% while in cattle The rate of liver fluke was highest in winter 1.57 % (16).

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