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Article

A Survey Study of The Infection of Hydatidosis in Animals Slaughtered in Arbil Slaughter for The Year 2021

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Abstract: A survey was conducted at the Arbil slaughterhouse to assess the prevalence of hydatid cysts among slaughtered animals from January 1, 2021, to June 30, 2021. The slaughtered animals comprised local breeds of both sexes (male and female), varying ages, and originating from different regions within the Arbil governorate. The identification of hydatid cyst lesions involved gross examination through visual inspection and palpation by hand. The study sample encompassed 67,568 sheep, 26,350 goats, and 10,187 cattle. The morbidity rate of hydatidosis was 1.79% (1,672 out of 93,125) across all slaughtered animals, with rates of 3.61% in sheep, 1.34% in cattle, and 1.25% in goats. The highest overall infection rate in slaughtered animals occurred in spring (3.38%), while the lowest was in winter (1.30%). The study revealed that the highest infection rates of hydatidosis in sheep, goats, and cattle were observed in Arbil (5.52%, 2.35%, and 2.29%, respectively). Additionally, the morbidity rate for lung cysts was 1.21%, with rates of 2.18% in sheep, 0.78% in goats, and 0.72% in cattle. Liver cysts had a morbidity rate of 0.67%, with rates of 1.05% in sheep, 0.51% in goats, and 0.44% in cattle.

Keywords: Prevalence, Hydatidosis, Arbil slaughter house, Arbil, Iraq.

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1. Introduction

Hydatid cysts disease is considered one of the parasitic diseases that is transmitted from carnivores to humans and animals that eat herbivores [1]. This disease arises from the formation of Hydatid vesicles of different sizes in the internal bowels, especially the liver and lungs of both humans and animals. Therefore, this disease is known as hydrocysts, thirst cysts, or hydatid cysts disease. The seriousness of this disease depends on the number, size and location of those cysts (7). The Hydatid cysts (vesicles) are the larval stage of Echinococcus granulosis [2], [3]. This worm is found in the intestines of dogs and predators. The worm is 2-8 mm long.

The infection arises from the contamination of human or animal food with the feces of dogs that carry tapeworm eggs. Additionally, transmission can occur through friction or direct contact with dogs that are infected. Which ranges in diameter from 1-15 cm (8,16).

The disease prevalence all over the world, especially the Middle East, southern Europe, eastern Africa and Australia, where animals and accompanying dogs abound [4]. The disease causes large economic losses, as stated in the yearly report of the Food and Agriculture Organization of the United Nations (FAO) that the disease causes large economic losses by 16% and 30% of the total animal production in developed and developing countries, respectively, due to the absence of control and treatment measures

in those countries [5]. (10,23) Where these losses are represented in damage to organs, poor quality of meat, decrease in milk production, decrease in weight and birth rates, as well as the costs of diagnosis and control (during animal husbandry), waste of efforts, human infection, costs of treatment and control (17,21) and due to the great importance of the disease, we conducted a survey study of the infection of Hydatid cysts in a slaughterhouse arbil for sheep, goats and cow [6].

2. Materials and Methods

The study was conducted in the Arbil slaughter, which is located in Arbil Governorate, for the period from (1/1/2021 to 30/6/2021). Where the statistics were taken from the Official records from the slaughterhouse were consulted, and field visits to the slaughterhouse were conducted for the same purpose, specifically to ascertain the count of slaughtered animals. reached 93125 slaughtered animals (67568 sheep, 15370 goats, 10187 cows) [7], [8]. The focus was on these two areas (liver and lungs) by Visual inspection and manual examination were employed to assess the size of the cysts and identify their distribution locations, aiming to differentiate them from other comparable lesions like cysts, tumors, and similar conditions. The number of animals infected with Hydatid cysts in the liver, the number of animals infected in the lung, the total number of animals slaughtered and the date of examination [9].

Data were analyzed according to the complete randomized design (CRD) system and using Duncan's-Multiple-Range-Test. Significantly different averages were distinguished by different letters of the alphabet (7).amination were recorded.

3. Results

Before The results of the field survey of sheep, goats, and cows slaughtered in the Arbil slaughter, and over a six-month period of study that stretched from the beginning of January 2021 to the end of June 2021, showed that the infection of Hydatid cysts was observed on the three aforementioned tested animals, and that the infection of these cysts was concentrated on both the liver and the lungs.

The data in Table (1) shows that the percentage of infection with parasites above varied according to the months of the year, the type of animal and the type of infected organ. Statistical analysis of the data in Table (1) showed a significant effect of the percentage of infection with parasites according to the months of the year [10]. In April, there was a notable difference compared to the other months, except for March, which did not exhibit significant variation. as the total infection rate during this month reached 2.56%. On the other hand, the lowest percentage of total Hydatid cysts was observed during February, amounting to 1.30%.

The statistical analysis also showed that there were no significant differences between all months except April in terms of the total infection rate [11]. The statistical analysis of the results of the study showed in Table (2) that sheep were more susceptible to infection, followed by cows and then goats, where the percentage of total infection with Hydatid cysts reached 3.61%, 1.34%, and 51.2%, respectively. In other words, the infection of sheep with hydatid cysts was higher [12], [13]. The infection of cows and goats increased by 2.69 and 2.88 times, respectively, while the infection of goats was almost equal to that of cows.

On the other hand, the results showed Table (3) that the type of organ affected the percentage of infection with hydatid cysts, and it was found that the percentage of infection of the lungs was 1.80 times higher than that of the liver, where the percentage of infection of the lungs was 1.21% and the percentage of liver infection was 0.67%, and the statistical analysis showed the table (3) A significant difference in the incidence of both lungs and liver [14].

The results show in Table (4) the effect of the interaction between the months of the year and the type of animal on the incidence of hydatid cysts [15]. From the data in Table

(4), it is clear that the infection rate varies according to the months of the year and the type of animal, and the variation was significant, as the highest infection rate was 5.52% in sheep during the month of April, which did not differ significantly from its value in each of

the sheep during the months of the year. On the other hand, the lowest percentage of hydatid cysts was 0.79% in goats during the month of February.

Table 1. shows the effect of months of the year on the percentage of total infection of hydatid cysts in each of sheep, goats and cows

Months	Average
January	1.41 c
February	1.30 c
March	2.56 ab
April	3.38 a
May	1.84 bc
June	1.93 bc

Type of animal	% of total infection
Goats	1.25 b
Cows	1.34 b
Sheep	3.61 a

Table 2. shows the effect of type of animal on the percentage of total infection of hydatid each of sheep, goats and cows

Organ / Type of animal	liver	lung
Cows	0.47 f	0.67 d
Goats	0.51 e	0.78 c
Sheep	1.05 b	2.18 a
% of total infection of organ	0.67 b	1.21 a

Table 3. shows the effect of type of organ on the percentage of total infection of hydatid cysts in each of sheep, goats and cows

Type of animal / months	Sheep	Goats	Cows
January	2.46 abc	0.91 c	0.87 c
February	2.22 abc	0.79 c	0.91c
March	4.51 ab	1.24 c	1.93 bc
April	5.52 a	2.35 abc	2.29 abc
May	3.78 abc	0.87 c	0.89 c
June	3.22 abc	1.39 c	1.18 c

A number of researchers studied the case of the spread of this areas of cattle breeding after 1990, due to the lack of periodic examinations for dogs and the poor health care for cattle, as well as the increase in animal slaughter outside abattoirs, especially in popular areas in cities, as well as in rural areas in all over Iraq, this ailment is recognized as endemic in regions with an environmental presence of dogs, cattle, and humans, as it completes its life cycle within this interconnected ecosystem [16], [17], [18].

The results of the study showed that the highest incidence of hydatid cysts occurred during the spring, and this is consistent with (13) in mosul, and differs from the results of each of (14) in kirkuk and (1) in Al-Qadisiyah University, which semester autumn and winter, respectively, and the reason may be due to the ideal conditions provided by spring for the growth and spread of the parasite [19]. For example, elevated temperatures adversely impact the development of hydatid cysts since the eggs released by the ultimate host (carnivores) are intolerant to dehydration, even for a brief duration. The longevity of the eggs varies between three days and one year, contingent upon favorable environmental conditions, specifically humidity and warmth (4).

The results also showed that the percentage of infection with hydatid cysts in sheep is higher than that of cows and goats, which amounted to 3.61%, and this result is consistent with the result recorded by each of (14) in Kirkuk and (18) in Mosul, which amounted to 4.38% and 4.34%, respectively. And it differs from the results of (19) in Arbil and (5) in Salah Al-Din, which amounted to 22.3% and 29.2%, respectively [20]. These differences are due to several reasons, including the different ages and sexes of the examined sheep, where the percentage of infection increases with age, as well as the type of seep breeds, as there are strains resistant to infection and others that are weakly resistant. Slaughterhouses infected with bags and the issue of neglecting infected corpses and not disposing of them and the easy access to them by stray dogs [21].

The results also showed that the percentage of lung infection with hydatid cysts is higher than the percentage of liver infection, and this is consistent with each of (12,22) and differs from each of (2,5), and the reason for this is that a number of fetuses can cross the liver with blood and reach the lung through The heart and its stability, as well as the diameter of blood vessels in cows, explained (9) that the infection of sheep with Echinococcus granulomatosis is concentrated in the lungs, as indicated (20) that the difference in the location of the sinusoids in each animal [22].

The results showed that the highest percentage of hydatid cysts infection was found in sheep during the spring, which amounted to 5.52%, and this is consistent with (5), which amounted to 4.54%, and differs from (1.2), which amounted to 42.5% and 21.3%, respectively [23]. The difference in proportions and seasons of the year is due to several reasons, including the number of samples taken, the geographical location of the region, the period and time of the study, the environmental conditions of each region, as well as the free grazing of animals and the issue of stray dogs, their control and treatment. Likewise, the age of the slaughter animals, as most of the sheep and goats are slaughtered at young ages, This prevents the cysts from maturing within this relatively brief timeframe, as the hydatid cysts typically require several months (6-8 months) to develop into cyst larvae (11,4)

4. Conclusion

From the results obtained in the current study, the following can be concluded: Hydatid cyst disease is widespread in Arbil governorate, and sheep are more susceptible to infection than other slaughtered animals. The highest incidence of Hydatid cyst was in the spring season, and the incidence of the lungs was higher than of the liver.

From the results obtained in the current study, and what has been concluded, the following can be recommended: we recommend conducting more studies on the spread of the disease. Conducting a thorough examination on animals in the slaughter. Slaughtering cattle in slaughterhouses licensed by the health authorities in the country. Preventing illegal slaughter in cities or rural areas. Disposing of leftovers from cattle and infected carcasses. In a healthy way, by burying and burning them, and preventing dogs from reaching them, and to areas near slaughterhouses or butchers' shops. Periodic examination of dogs and treating them against these worms. Controlling stray dogs. Organizing grazing and directing it towards clean pastures free of pollution, and combating and cleaning polluted pastures. Public awareness and health education among all segments of society of the danger of hydatid cysts.

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