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STUDIES ON HYDATIDOSIS IN SHEEP AND GOATS AT LAHORE, PAKISTAN

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ABSTRACT

The aim of present study was to observe the current status of hydatidosis in small ruminants at Lahore. A total of 4800 animals comprising 2400 sheep (784 hoggets and 1616 adults) and 2400 goats (561 young, 1839 adults) of both sexes were examined at Lahore abattoir during slaughtering from March 2010 to February 2011. In sheep, 14 (1.79 %) hoggets including 12 (1.78%) males and 2 (1.80 %) females and 184 (11.38%) adult sheep including 139 (11.12%) males and 45 (12.30%) females were infected. 6 (1.06%) goats comprising 4 (0.87%) males and 2 (1.94%) females under one year of age and 143 (7.77 %) above one year having 99 (7.58%) males and 44 (8.25%) females were found infected with hydatidosis. Overall prevalence in sheep was 8.85% and 6.21% was in goats. During postmortem, the organs like lungs, liver, heart, spleen and abdomen & thoracic cavity were examined. [In both sexes of sheep, the mean percentage of organ distribution of hydatid cyst was recorded as [45.19 % lungs], [33.91 % liver], [19.55 % lungs and liver in situs], [2.06 % heart], [2.39 % spleen], and [6.9 % abdomen and thoracic cavity]. The mean of organ distribution of hydatid cyst in goats was recorded as 34.38 % lungs, 40.56 % liver, 16.95 % lungs and liver in situs, 0.49 % spleen and 7.63 % abdomen and thoracic cavity. In sheep, highest infection was observed in lungs whereas liver was most infected organ in goats. No seasonal variation was observed in the prevalence of hydatidosis in sheep and goats throughout the year. Fertility of hydatid cysts removed from liver and lungs of sheep and goats were studied and it was found that apparently hepatic cysts were more fertile as compared with the pulmonary cysts in both the species but the difference was not significant (P = 0.87).

Key words: [Hydatidosis, sheep, goats, Lahore].

INTRODUCTION

[Hydatidosis] is one of the important zoonotic parasitic diseases caused by larval stage of genus *Echinococcus*, a tape worm of dog. The disease has a worldwide geographical distribution. Seven species of the genus Echinococcus have been explored including *E. granulosus, E. multilocularis, E. vogeli, E. oligarthus and E. shiquicus E. equines E. ortleppi* but *E. granulosus* is most important and widespread.

It affects almost all the domestic animals and human. In countries like Iraq, Iran, Syria, Lebanon, Jordan, Saudi Arabia, Kuwait and Pakistan domestic animals (cattle, goat, sheep, buffalo, camels and donkeys) have been found infected with cystic echinococcosis (Daryani *et al.*, (2009). It is characterized by the formation of single or multiple cysts of various sizes ranging from the size of a pea to medium sized foot ball (Surhio *et al.*, 2011). The disease causes a lot of public health problems and considerable financial losses to meat industry in the form of condemnation of the infested organs throughout the world. As there are no prominent symptoms of this disease in animals, therefore it is difficult to diagnose it and it depends upon observation of cyst fluid on laprotomy or necropsy. The disease can be controlled through regular deworming of pets, killing of stray dogs, proper disposal of animal carcasses and offal, educating the humans and improving the hygienic measures (Urquhart *et al*., 1996). Transmission of the tape worm occurs between dogs and domestic animals and vice versa (Wen *et al.*, 1993).

MATERIALS AND METHODS

The present study was conducted at Lahore (Pakistan) to understand the current picture about the prevalence of hydatidosis in sheep and goats slaughtered during the period from March 2010 to February 2011. A total of 4800 sheep and goats (young and adults) were randomly examined for the prevalence of hydatid cysts during slaughtering at Lahore metropolitan abattoir. The slaughter house was visited two times a week on Monday and Thursday. The animals were divided into two groups i.e. less than one year and above one year and examined in hanging

position after removal of hide. Then the infected organs like liver, lungs, spleen, heart, kidneys, were removed from the carcass and examined at the spot for the presence of hydatid cysts. Livers were observed by cutting the right and left lobes with a number of small cuts and both surfaces were examined by palpation and spleens were examined through visual inspection. Data regarding the prevalence of hydatid cyst in species, age, organ distribution and seasonal effects were recorded. For seasonal effects, the year was divided into four quarters i.e. spring, summer, autumn and winter. During postmortem examination, many cysts of various sizes were collected from lungs and liver of sheep and goats and brought to the post graduate laboratory at University of Veterinary and Animal Sciences Lahore where the surface of the cysts was sterilized with alcoholic iodine solution (Ref. # IOD00159F, Orion). Then the cyst wall was penetrated by a large size needle and a cut was given with scalpel and scissors and the contents were transferred into sterile containers and the same quantity of 0.1 % aqueous eosin solution was added into it and observed under light microscope. The cysts, in which even one viable protoscolex was present, were considered as fertile and the cysts in which there were no protoscolex or no viable protoscolex was present and the suppurative or calcified cysts were considered as unfertile cyst (Dalimi *et al*, 2002). The data was analyzed by using Chi-Square test with "STATA" software.

RESULTS AND DISCUSSION

In present study, overall prevalence of hydatidosis in sheep was found as 8.25 %. These findings are in agreement with the findings of Muat *et al*., (2009), Fakhar and Sadjjadi, (2007), Khalidi, (1998) and Gusbi *et al*., (1987). The prevalence observed in this study, indicated that there might be an increasing trend in the prevalence than reported in previous studies by Shafiq, (2003) and Latif *et al*., (2010). This increase might be attributed to increase in the sheep population in the country or the number of stray dogs. The prevalence reported by Azlaf and Dakkak, (2006) is partially different from present study. The dissimilarity may be attributed to different geographical areas. Some authors reported higher prevalence in sheep than that of the present study like Kebebe *et al.,* (2010) reported 19.94 %, Lofti and Shahriar, (2007) reported 30.5 %, Daryani *et al*., (2007) reported 74.4 %, Chi P *et al.,* (1990) reported 88.6 % and Dueger and Gilman, (2001) reported 77.4 %. The reasons may be different sample size and age of examined animals. Dalimi *et al.,* (2002) reported 11.1 % prevalence in sheep; the difference may be due to the long duration of study.

In hoggets, the prevalence was almost similar in males (1.78 %) and females (1.80 %) but in adults, it was significantly higher (12, 30 %) in females as compared with males (11.12%) (P=00001) (Table 1). These findings are in agreement with those of Shafiq, (2003), Anwar *et al.*, (2000), Anwar *et al*.,(2008), Daryani *et al.,* (2007) and Shekhawat *et al.*, (2006). The reasons may be the longer age of females at the time of slaughtering and the stress of pregnancy, parturition and lactation. The prevalence was significantly higher (11.38 %) in adults than in hoggets (1.79 %) (P=00001) which may be attributed to the life span of these animals. Similar were reported by Christodoulopoulos *et al.,* (2002) and Gusbi *et al*., (1987). Ghazani *et al.,* (2008) reported totally opposite results. The difference may be due to different sample size and very high prevalence of hydatidosis in Turkey.

The prevalence was much higher (7.58 %) in adult males than in young ones (0.87 %) (P=0.00001). Similarly there was a significant difference in the prevalence between young (1.94 %) and adult females (8.25 %) (P=0.00001).

In the present study, overall prevalence in goats was recorded as 6.21 % which is significantly lower than the found in sheep (8.25 %). Almost similar prevalence was reported by Dalimi *et al*., (2002), Khalidi, (1998) and Ibrahim, (2010). Njoroge *et al.,*(2002) reported 4.5 % prevalence in goats that is very near to the results of the present study. Kebebe *et al*., (2010), Lofti and Shahriar, (2007), Daryani *et al*., (2007), Dalimi *et al.,* (2002) reported the prevalence higher than that of the present study. The reason may be attributed to different geographical conditions and there close association with the dogs. Similar results have been reported by Chi P *et al.,* (1990). Kumar *et al*., (2008), Fakhar and Sadjjadi, (2007) and Azlaf and Dakak, (2006) reported the lower prevalence as compared with the present study. It may be due to better control measures adopted, grazing areas for the animals and controlled slaughtering measures to avoid the approach of stray dogs to meat offal. The prevalence was significantly higher in adult male sheep than that in adult male goats (P=0.0009) (Table 2).

Seasonal prevalence was recorded in both species. Apparently it was different but statistically this difference was not significant (P>0.05) during all the four seasons (Table4). The findings are in agreement with the findings of Ahmadi and Meshkekker, (2010) and Khan *et al.,* (2002).

It was observed that cysts removed from liver in both the species were more fertile than those of collected from lungs (P>0.05). Daryani *et al.*, (2009), Daryani *et al*., (2007), Garica *et al*., (1997) and Yildiz and Gurcan, (2005) also reported that hepatic cyst are more fertile than the cysts found in lungs. Salem *et al.*, (2011), Ahmed *et al.*, (2006) and Scala *et al*., (2006)

reported the different results that the cysts found in lungs were more fertile than those of liver. Same fertility rates in lungs and liver cysts in sheep were reported by Khan *et al*., (2001), (Table 6).

Table 1: Prevalence of hydatidosis in sheep by age and sex

Gender	Hoggets(< 1yr)			Adults(>1yr)		
	Examined	Infected	Prevalence (%)	Examined	Infected	Prevalence (%)
Male	673	12	1.78	1250	139	11.12
Female	111	2	1.80	366	45	12.30
Total	784	14	1.79	1616	184	11.38
Mean ± S.E			1.79± 0.01			11.71±0.59

Table 2: Prevalence of hydatidosis in goats by age and sex

Sex	Below one year (Young)			Above one year of age (Adults)		
	Examined	Infected	Prevalence (%)	Examined	Infected	Prevalence (%)
Male	458	4	0.87	1306	99	7.58
Female	103	2	1.94	533	44	8.25
Total	561	6	1.06	1839	143	7.77
Mean ± S.E			1.40±0.54			8.23±0.36

Table 3: Showing over all Prevalence of hydatid cysts in sheep and goats

Gender	Sheep			Goats		
	Examined	Infected	Prevalence (%)	Examined	Infected	Prevalence (%)
Male	1923	151	7.85	1764	103	5.83
Female	477	47	9.85	636	46	7.23
Total	2400	198	8.25	2400	149	6.21
Mean ±S.E			8.85 ± 01*			6.53±0.70*

Table 4: Seasonal prevalence of hydatidosis in sheep and goats

Species	No. Infected	Spring (Mar-Apr) No (%)	Summer (May-Sep) No (%)	Autumn (Oct-Nov) No (%)	Winter (Dec-Feb) No (%)
Sheep	198	47 (23.74)	50 (25.25)	48 (24.24)	53 (26.77)
Goat	149	36 (24.16)	38 (25.50)	41 (27.52)	34 (22.82)

Table 5: Comparison of Organ-wise distribution and percentage of hydatid cysts in both species.

Organs with cysts	Sheep(n=2400)		Goats (n=2400)	
	No. of infected Animals	Infection Rate (%)	No. of Infected Animals	Infection Rate (%)
Lungs	90	45.45*	51	34.23
Liver	67	33.84	60	40.27*
Lungs + Liver	20	10.10	25	16.78
Heart	4	2.02	0.00	0.00
Spleen	5	2.53	01	0.67
Abd.+ Thor. cavity	12	6.06	12	8.05
Total	198	8.25	149	6.21

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