

Studies on the prevalence of caprine and ovine hydatidosis at slaughter houses of Larkana, Pakistan

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Abstract

A total of 1000 carcasses of sheep (500) and goats (500) of different ages were examined from January 2005 to December 2005 at the slaughter houses of Larkana, Sindh (Pakistan). 53 (10.6%) sheep and 51 (10.2%) goats were found infected with hydatidosis. Liver was the most infected organ (8.8%), whereas spleen and heart were the least infected (0.2%) in goat. In sheep highest percentage (8.8%) of infection was recorded in the lungs and lowest (0.2%) in the heart. In sheep, the length of cyst ranged between 1 to 12, 1 to 10 or 0.5 cm in liver, lungs and heart respectively. In goats, the length of hydatid cysts was recorded as 1 to 9, 1 to 7, 1 and 0.75 cm in liver, lungs spleen and heart respectively. In sheep, the average numbers of hydatid cysts were found as 5.5, 4 and 1 liver, lungs and heart respectively, whereas in case of goats the average numbers of cysts were 5.5, 5 and 1.5 in liver, lungs and spleen respectively. Moreover, only 1 cyst was found in heart. Sheep fell in age category of 25 months and above were more infected (16%) compared to 13 to 24 (7.24%) and 6 to 12 months (2.05%) old. Likewise, the prevalence in goats was 13.88, 8.59 and 3.26% respectively in the same age groups. The highest rate of infection was recorded in the month of January (23.80%) and May (19.51%) in sheep and goat respectively. This data will help in controlling strategies of hydatidosis in small ruminants.

Key word: *Echinococcus granulosus*, Hydatidosis, Hydatid Cyst, Sheep, Goats

Introduction

Hydatidosis is a major parasitic disease of veterinary and public health importance throughout the world. The disease has great economic and zoonotic importance because it affects almost all the domestic animals and human. The disease is caused by *Echinococcus granulosus* and is characterized by the formation of single or multiple cysts (hydatidosis) varying in size from that of a pea to medium sized foot-ball.

Sheep, goats, cattle, Buffaloes, horses, pigs and men act as intermediate hosts. Hydatid disease, not only results in loss of millions of rupees each year, but also it worsens the protein deficiency for human consumption in terms of condemned organs and lowered productivity of infected animals (Iqbal et al., 1989).

Echinococcus granulosus has a broad geographical and cosmopolitan distribution. The cysts are mainly found in the liver, lung, spleen, kidneys, and other organs of the intermediate hosts, develop slowly over several months. *Echinococcus granulosus* is the main species, the adult worm grows only in carnivores and is extremely small in size with three to four segments (Soulsby, 1982).

The eggs of the parasite may develop particularly in any mammal to form cysts, within the cysts which are filled with fluid and grow many secondary cysts, very small in diameter and within each of these cysts dozen of scolices are produced. The secondary cysts are known as brood capsules, the scolices may sometimes grow independently of these capsules but within the cysts. Animals especially dogs may harbour hundreds and thousands of adult worms of this specie.

Even in the clinical stage, the major symptoms in animals are weakness and emaciation (Sheikh and Hussain, 1967). In the absence of prominent symptoms, the diagnosis of disease is usually difficult and it depends upon the demonstration of scolices, brood capsules of daughter cysts in hydatid fluid either on laparotomy or necropsy (Crosby et al., 1968). The human-beings are infected during the close contact with the dogs or by direct consumption of infected organs, drinking water or green vegetables polluted by faeces of infected dogs (Schantz et al., 1995).

A more effective approach to control this disease would be one which eliminates the source of infection in dogs i.e. the larval stages in sheep and other ruminants, besides regular deworming of pets and elimination of

stray dogs (Eckert et al., 2001). The disease controlled programme is limited due to lack of sensitive and specific methods of diagnosing hydatidosis in livestock prior to slaughter (Schant, 1983).

Therefore, the present study was carried out to record the prevalence of hydatidosis in sheep and goats in slaughter houses of Larkana, Pakistan.

Materials and Methods

A total of 1000 carcasses of sheep (500) and goats (500) of different age groups were examined from January 2005 to December 2005 at the slaughter houses of Larkana, Pakistan. The viscera such as liver, lungs, spleen, heart and kidneys of the slaughtered animals were collected and examined for the presence of cysts. The number of cysts in each organ was recorded. The infected organs were collected in plastic bottles containing 10% formalin as preservative and then samples were brought to the Department of Veterinary Parasitology, University of Agriculture, Tandojam, Pakistan.

The infection was described as slight if a quarter of the organ was affected, moderate if half of the organ was affected and severe if almost the entire organ was infected. The infected organs as well as the size (in cm) and consistency of the cysts were recorded. In order to explore the relation between age and prevalence of disease, all the animals under study were segregated in three age groups viz., 6-12, 13-24 and 25 months and above.

Results

The results recorded revealed that 53 sheep (10.6%) and 51 goats (10.2%) were infected with hydatidosis, and overall percentage of infection was recorded as 10.4%. During post-mortem examination the major organs like lungs, liver, spleen, heart and kidneys were examined. In goats the highest rate of infection (8.8%) was recorded in liver and the lowest (0.2%) in spleen and heart. No cyst was found in Kidneys. In sheep the highest percentage (8.8%) of infection was recorded in lungs (Table 1).

Table 1: Organ-wise distribution of Hydatid cysts in sheep and goats

| Organs | No. of carcasses examined | | Infected (%) | |
|---------|---------------------------|-------|--------------|----------|
| | Sheep | Goats | Sheep | Goats |
| Liver | 500 | 500 | 36 (7.2) | 44 (8.8) |
| Lungs | 500 | 500 | 44 (8.8) | 37 (7.4) |
| Spleen | 500 | 500 | 00 | 01(0.2) |
| Heart | 500 | 500 | 01 (0.2) | 01 (0.2) |
| Kidneys | 500 | 500 | 00 | 00 |

In sheep minimum 1, maximum 10 and at average 5.5 number of hydatid cysts were found in liver, whereas maximum 7, minimum 1 and average 4 cysts were found in lungs. Only 1 number of hydatid cyst was recorded in heart, whereas no cyst in spleen and kidneys was found. In case of goats maximum 10, minimum 1 and average 5.5 cysts were observed in liver, whereas 09, 1 and 5 numbers of hydatid cysts were found in lungs as maximum, minimum and average, respectively. In spleen 2, 1 and 1.5 cysts were recorded as maximum, minimum and average respectively. Only 1 cyst was found in heart and no cyst was found in kidneys (Table 2).

The size of the hydatid cyst found varied among the organs investigated. In the sheep, the size of the cyst varied from 1 to 12 cm in liver, 1 to 10 cm in lungs and 0.5 cm in the heart. In goats, the size of the hydatid cyst of liver was recorded as 1 to 9 cm, 1 to 7 cm in lungs, 0.75 cm in spleen and 1 cm in heart (Table 3).

The highest rate of infection (16%) was recorded in sheep older than 2 years, followed by age group of 13 to 24 months (7.24%) and 6 to 12 months (2.05%). Likewise, the prevalence of disease in goats was 13.88, 8.59 and 3.26% in the above mentioned groups, respectively (Table 4).

In sheep the highest (19.51%) incidence of hydatid cyst was recorded in the month of May and the lowest (5.88%) in the month of February. In Goats, the highest incidence (23.80%) was found in the month of January and lowest infection (5.24%) in the month of September (Table 5).

Table 2: Minimum and maximum number of hydatid in infected organs of sheep and goats

| Organs | Min. Number | | Max. Number | | Average | |
|---------|-------------|-------|-------------|-------|---------|-------|
| | | | | | | |
| | Sheep | Goats | Sheep | Goats | Sheep | Goats |
| Liver | 01 | 01 | 10 | 10 | 5.5 | 5.5 |
| Lungs | 01 | 01 | 07 | 09 | 4.0 | 5.0 |
| Spleen | 00 | 01 | 00 | 02 | 00 | 1.5 |
| Heart | 01 | 01 | 00 | 00 | 00 | 00 |
| Kidneys | 00 | 00 | 00 | 00 | 00 | 00 |

Table 3: Size of hydatid cysts in infected organs of sheep and goats

| Organs | Sheep | | Goats | |
|---------|-----------|-----------|-----------|-----------|
| | Min. (cm) | Max. (cm) | Min. (cm) | Max. (cm) |
| Liver | 01 | 12 | 01 | 12 |
| Liver | 01 | 10 | 01 | 10 |
| Lungs | 00 | 00 | 0.75 | 00 |
| Heart | 0.5 | 00 | 01 | 00 |
| Spleen | 00 | 00 | 00 | 00 |
| Kidneys | 00 | 00 | 00 | 00 |

Table 4: Age-wise rate of infection of hydatidosis in sheep and goats

| Age group (months) | No. of Carcasses examined | | No. of infected (%) | |
|--------------------|---------------------------|-------|---------------------|------------|
| | Sheep | Goats | Sheep | Goats |
| 6 – 12 | 98 | 92 | 2 (2.05) | 3 (3.26) |
| 13 – 24 | 152 | 163 | 11 (7.24) | 14 (8.59) |
| 25 – above | 250 | 245 | 40 (16.00) | 34 (13.88) |
| Total | 500 | 500 | 53 (10.60) | 51 (10.2) |

Table 5: Month-wise incidence of hydatidosis in sheep and goats

| Month | Sheep | | Goats | |
|-----------|-----------------|---------------------|-----------------|---------------------|
| | No. of examined | No. of infected (%) | No. of examined | No. of infected (%) |
| January | 52 | 6 (11.53) | 42 | 10 (23.80) |
| February | 34 | 2 (5.88) | 28 | 2 (7.14) |
| March | 33 | 3 (9.09) | 28 | 3 (10.71) |
| April | 57 | 7 (12.28) | 46 | 5 (10.86) |
| May | 27 | 5 (19.51) | 47 | 5 (10.63) |
| June | 60 | 7 (11.66) | 50 | 6 (12.00) |
| July | 45 | 7 (15.55) | 79 | 5 (6.32) |
| August | 72 | 7 (9.72) | 82 | 5 (6.09) |
| September | 24 | 3 (12.4) | 19 | 1 (5.24) |
| October | 34 | 3 (8.82) | 30 | 3 (10.00) |
| November | 22 | 0 | 19 | 2 (10.52) |
| December | 40 | 0 | 30 | 4 (13.33) |
| Total | 500 | 53 (10.6) | 500 | 51 (1.2) |

Discussion

Haridy et al. (2000) and Njoroge et al. (2002) observed hydatid cyst infection in sheep as 0.33 and 3.6 respectively. In case of goats, Haridy et al. (2000), Njoroge et al. (2002) and Azlaf and Dakkak (2006) observed prevalence as 4.5, 3.4 and 1.88%, respectively. The results of the above workers highlighted prevalence rate of hydatid cysts in sheep and goats lower than current study. Deviation may be attributed to the climatic condition or good veterinary practices in the areas of study.

Dueger and Gilman (2001), Tashani et al. (2002), Sortiraki and Korkoliakou (2003), Umur (2003) and Akhlaghi and Housaini (2005) detected the prevalence as 43.4, 77.4, 20, 80 and 26.6% respectively in sheep. However, in goat prevalence of infection was observed by Dorchie et al. (2000), Sotiraki and Korkoliakou (2003) and Umur (2003) as 28.4, 24 and 22.1 respectively. The present findings are not in agreement with the above mentioned workers, The possible reason may be climatic condition and the husbandry status of the livestock which may vary in different areas.

Saeed et al. (2000), Dalimi et al. (2002), Elmahdi et al. (2004), Afzal and Dakkak (2006) observed the prevalence as 14.1, 6.0, 10.58 and 10.3%, respectively

in sheep. In case of goats, Saeed et al. (2000) and Dalimi et al. (2002) observed the prevalence as 6.2 and 6.3%, respectively. The findings of the above workers are in partial agreement with the findings of present study.

Murat et al. 2009 reported that 114 (8.0%) out of 1421 younger sheep and 47 (13.3%) out of 351 older sheep were infected with hydatid cyst, these results do not coincide with the present study results. Ibrahim 2010 highlighted that the incidence in age group 1-2years of sheep (8.8%) and goat (4.27) were high than under one year of age. These findings are coinciding with our results. The prevalence trend of the hydatid cystic infection clearly indicates that the aged animals were under the higher risk of occurrence of disease in comparison of young ones.

Bilquess (1984) recorded infection rate of hydatidosis as 23% in the month of December while bhutto (1994) reported an incidence rate as 25% in the month of June. In our study, the disease prevails round the year and appears to have no strong relation with the season. The results of the present study provide a base line data on hydatidosis in small ruminants which will help in controlling of this disease.

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