Original Article

Prevalence of Hydatidosis in Animals in Different Abattoirs of Punjab, Pakistan from 2004-2008

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ABSTRACT

Objective: Hydatidosis is a zoonotic public health problem globally and in Pakistan also causing illness in human and animals. The purpose of this study was to determine the prevalence of disease.

Study Design: None randomized prospective study.

Place and Duration of Study: This study was conducted in different abattoirs of Punjab (Faisalabad and Lahore), Pakistan from 2004-2008.

Materials and Methods: In present study 39738 male and female animals (sheep, goats, buffaloes, cattle and camels) were examined. Liver and Lungs were main visceral organs with bigger size of cyst collected and processed on Real Time PCR.

Results: Highest prevalence (%) was found 7.29 (102/590) in camels and lowest 5.18 (155/2990) in cattle. Prevalence of fertile cysts was also determined and found highest (95%) in camels and lowest (75%) in cattle. Sterile, calcified and under developed cysts were also seen but without any significant number, except in cattle sterile cysts were significantly high ($P<0.05$). Study showed high prevalence in two (Faisalabad and Lahore) out of six abattoirs visited in different big cites.

Conclusion: It is concluded that in Punjab hydatidosis is significantly prevalence. The major cause of this prevalence is improper disposal of infected organs and unhygienic conditions of abattoirs.

Key words: Hydatidosis, hydatid cyst, fertile and sterile cyst, animal, Pakistan.

INTRODUCTION

Hydatidosis an important zoonotic disease caused by metacestode of the dog tapeworm *Echinococcus granulosus.* It is worldwide in distribution with both sylvatic and pastoral epidemiology[1]. Parasite life cycle is completed when the definitive host eats an infected intermediate host organ; human exposure is by faecal-oral way, with water or food contaminated by faeces of infected definitive host[2].

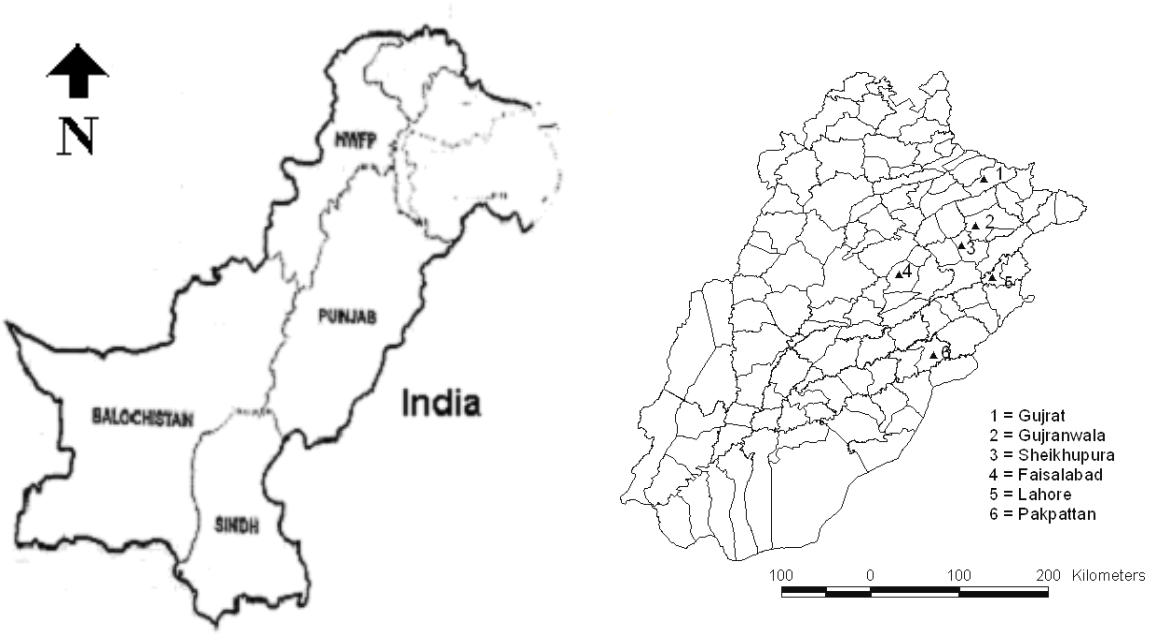
Prevalence (%) of hydatidosis was reported in different animals, cattle, sheep and camels in Sudan[3], goats, sheep, cattle and camels in Kenya[4], camels, goats, sheep, pigs, cows and buffaloes in Egypt[5] respectively. Hydatidosis occurrence in India was also recorded in sheep, cattle, buffaloes, goats, and pigs[6].

Hydatidosis is also well recognized zoonotic disease in Pakistan, affecting human and his livestock, various human cases has been reported[7]. In Punjab, Pakistan the prevalence of this disease in livestock has been studied previously[8] with reported a prevalence ranging from 5-46% in sheep, cattle, goats, buffaloes and camels reported that only 4% people were aware about hydatidosis, level of connection of dogs with livestock and humans. The present study was intended to find out the prevalence of hydatid cysts in ruminants slaughtered at six abattoirs (Gujrat, Gujranwala, Sheikhupura, Faisalabad, Lahore and Pakpattan) of Punjab.

MATERIALS AND METHODS

To check the prevalence of hydatidosis in sheep, goat, buffalo, cattle and camel, six different slaughter houses in district Gujrat, Gujranwala, Sheikhupura, Faisalabad, Lahore and Pakpattan in Punjab (Fig 1) were visited to collect infected visceral organs. Organs were inspected visually, by cutting both surfaces, incisions and by palpation. Hepatic and pulmonary hydatid cysts (Fig 2) were selected from 125 sheep, 110 goats, 102 buffaloes, 101 cattle and 100 camels for studies. Hydatid cyst fluid (HCF) was aspirated and centrifuged at 500 rpm for five minutes.

Fertility of cyst was determined by microscopic observation of the germinal layer and viability of protoscoleces was checked by examination at 10X without staining observing flame cell activity and also using a vital dye (eosin 0.1%). In cases of non fertile or sterile cysts, the presence of non viable protoscoleces and degenerative modifications (calcification) were also noted[9]. Statistical analysis was done by Chi square (SPSS version 13.0).



A B

Fig. 1: Different study areas in Punjab A: Map of Pakistan B: Map of Punjab (Gujrat, Gujranwala, Sheikhupura, Faisalabad, Lahore, Pakpattan).

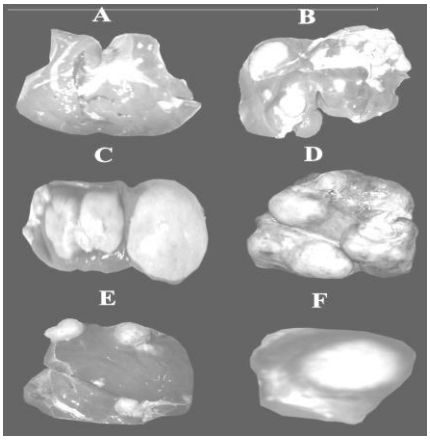
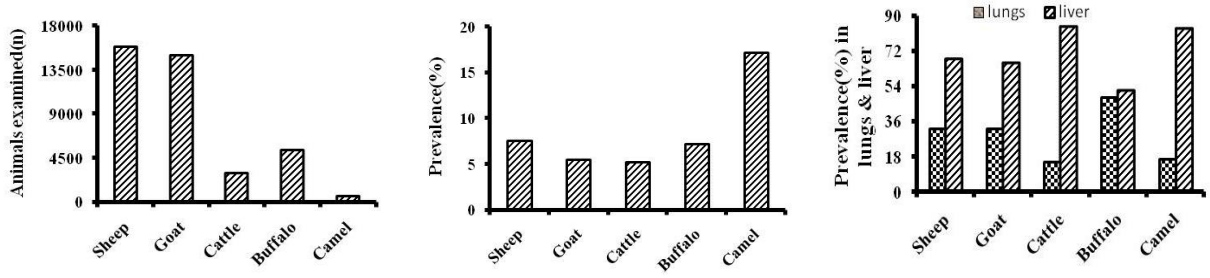


Fig. 2: Hydatid cysts in lungs and livers of various animals A: Normal liver of goat. Cysts in B: Sheep liver C: Buffalo liver D: Camel lungs E: Goat liver F: Cattle liver

RESULTS

Prevalence (%):

A total of 39738 animals comprising 15857 sheep, 15001 goats, 5300 buffaloes, 2990 cattle and 590 camels of both genders were examined for hydatid cysts. Prevalence of hydatidosis recorded was 1193(7.52%) in sheep, 822 (5.48%) in goats 155 (5.18%) in cattle 381 (7.19%), in buffaloes and 102 (17.29%) in camels (Fig. 3). Chi-Square analysis revealed that overall prevalence of diseases was significantly high ($P<0.05$) in camels and lowest in cattle.



A B C

Fig. 3: Bar graph represents prevalence (%) of hydatidosis in various animal species slaughtered in different abattoirs

(A) Total number of animals examined (B) Comparative prevalence (%) of hydatidosis in various animals (C) Prevalence (%) of hydatidosis in various organs (lungs & liver) of infected animals

Organ specificity (%)

Liver and Lungs were main visceral organs effected by hydatidosis, with bigger size of cyst detected in liver. The prevalence (%) documented during study was 32.19 in lungs and 67.81 in liver for sheep, for goats 32.60 in lungs and 66.18 in liver, for buffaloes 48.29 in lungs and 51.71 in liver, in cattle 15.48 in lungs and 84.51 in liver, for camels 16.66 in lungs and 83.33 in liver (Fig. 2 and Fig. 3). Chi-Square analysis revealed significantly higher distribution of hydatid cysts (P<0.05) in lungs and liver of sheep, goats, buffaloes, cattle and camels respectively

Comparison of prevalence (%) of hydatid cysts among different animals (A) Fertile (B) Sterile (C) Calcified (D) Under developed

Types of cysts

Cysts prevalence (%) was noted on the basis of fertile, sterile, calcified and under-developed. In sheep, for total of 125 hydatid cysts examined, 108 (86.40%) fertile, 8 (6.40%) sterile, 6 (4.80%) calcified, 3 (2.40%) under developed were found. In goats total of 110 hydatid cysts found to comprise 87 (79.09%) fertile, 7 (6.36%) sterile, 6 (5.45%) calcified, 10 (9.09%) under developed. In cattle total of 101 hydatid cysts contained 76 (75.24%) fertile, 15 (14.85%) sterile, 4 (3.96%) calcified, 6 (5.94%) under developed. In buffaloes total of 102 hydatid cysts, 86 (84.31%) fertile, 10 (9.80%) sterile, 5 (4.90%) calcified, 1(0.98%) under developed were recorded. In camels total of 100 hydatid cysts, 95 (95.00%) fertile, 2 (2.00%) sterile, 1 (1.00%) calcified, 2 (2.00%) under developed were found (Fig. 4).

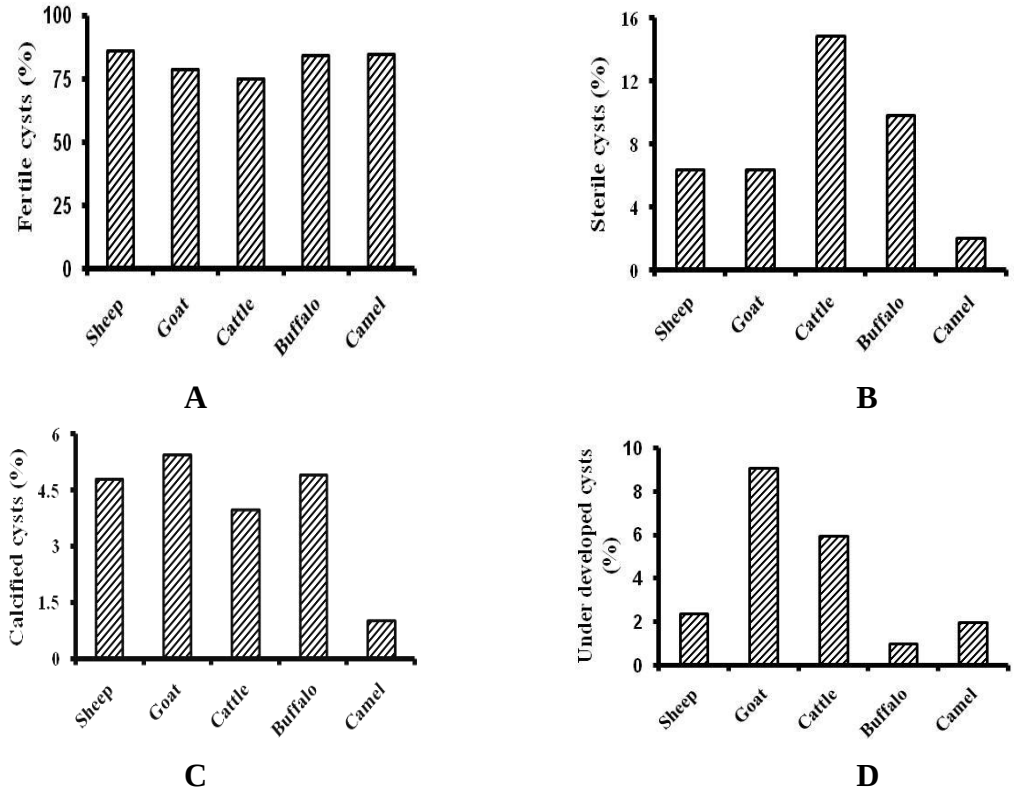


Fig. 4: Bar graphs showing epidemiological investigation of various types of hydatid cysts in animal species infected with hydatidosis in Punjab

DISCUSSION

The prevalence (%) of hydatidosis recorded was 7.52 (1193; sheep), 5.48 (822; goats), 5.18 (155; cattle), 7.19 (381; buffaloes) and 17.29 (102) in camels. The results of present study are different from the various studies carried out globally in recent years due to the variations in geographical conditions. Prevalence (%) of hydatidosis was reported in different animals, cattle (3), sheep (7) and camels (45) in Sudan (10), goats (4.5), sheep (3.6), cattle (19.4) and camels (61.4) in Kenya[11]. Hydatidosis occurrence in India was also recorded in sheep (2.30–93.2%), cattle (7.1–68.9%), buffaloes (8.90–69.0%), goats (1.1–72.7%) and pigs (11.5%) respectively[12].

From Pakistan prevalence (%) was reported in ruminants in sheep (8.3), cattle (5.5–9.6), goats (7.5) and buffaloes (12.3–4) respectively[13]. Our investigations are different from previous reported results because they studied before 20 to 25 years and they collected information only from one abattoir from each selected city. From our present results only

prevalence (%) in goats was matched with findings of Iqbal et al[14].

Our present results showed that the location of hydatid cysts in various organs (lungs and liver) differed significantly among sheep, goats, buffaloes cattle and camels as well as between different organs of the same species of animal. Prevalence (%) of hydatidosis in livers of sheep (46.74) and goats (23.28)[15]. The liver was the predominant site of infection in both animals[16]. In Egypt its prevalence was detected among camels, goats, sheep, pigs, cows and buffaloes, significantly different between animals regarding liver and lungs infection. Rate of infection (%) of hydatidosis in liver and lungs of cows 4.84 and 4.41, for sheep 5.05 and 6.84 respectively[17].

In Pakistan liver infection in sheep has been reported 8%, 2.83 % and 15.9 %[18]. In present study liver was more infected organ with hydatidosis instead of lungs among all animals, sheep (67.81%), goats (66.18%), buffaloes (51.71%), cattle (84.51%) and camels (83.33%). In our results more hepatic (51.71) infections were found as compared to pulmonary (48.29) in buffaloes, which were similar[19]. The present study revealed significantly higher occurrence of hydatid cysts in lungs and liver of sheep, goats, buffaloes, cattle and camel respectively. These present results were similar to the investigations[20].

Different under developed hydatid cysts were investigated might be due to immunological response of the host which prevent extension of cyst[21]. The calcified cysts in liver might be due to the numerous connective tissue reaction of the organ[22]. Different strains of *E.* granulosus might cause the variation in fertility rate in various environmental regions[23]. Various types of hydatid cysts of cattle were examined in Tigray Region of Ethiopia and found 32.11% sterile, 54.39% calcified, 10.66% fertile and viable, while 2.80% were fertile but nonviable (24). Our results revealed that the prevalence of various types of cysts in Punjab, the cysts were either sterile (42.7%) or calcified (57.3%), no fertile cysts were found. Studied hydatidosis in sheep and found that out of 4072 collected cysts, 1023 were sterile, 178 caseous, 2339 calcified and 532 fertile in Sardinia. Result deviations might be associated with many factors of intermediate host like age, seasonal diversity in different regions.

These characteristics findings have never been reported in Pakistan earlier. Our investigations revealed that Prevalence of fertile cysts was significantly high in all animals as compared to sterile and under developed cysts. These findings showed variations from previous researchers work might be due to geographical distributions. However, the prevalence of calcified cyst was insignificantly high in camels as compared to sheep, goats, buffaloes and cattle. Our results revealed that prevalence was significantly higher among all animal species. However, camels showed high prevalence as compared to sheep, goats, buffaloes and cattle.

CONCLUSION

Keeping in view, it is concluded that in Punjab hydatidosis is prevalent due to stray dogs and their easy approach to the abattoirs, improper disposal of hydatid organs and unhygienic conditions of abattoirs. Unawareness about the parasite life cycle has made the situations more favourable for the perpetuation of the disease. Backyard slaughtering of livestock is common in rural areas, particularly at religious occasions, for example Eid-ul Adha. Therefore it is suggested that more effort should be done for the prevention of hydatidosis and inexpensive protective actions should be in use to eliminate the threat to humans and as well as to animals.

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