Prevalence, Organ Specificity and Economic Impact of Hydatidosis in the Cattle Slaughtered In the Lahore Abattoir

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Abstract
A total of 3158 cattle (0.01% from the total slaughtered population 283157) were examined randomly macroscopically for the presence of hydatid cysts in Lahore abattoir from 1999 through 2003. The prevalence rate of hydatid disease was recorded as 6.43% (n=203). A difference in the prevalence rate of 1.20% (n=38) and 4.27% (n=135) was recorded in male and female cattle respectively. The prevalence rate in female was significantly higher (p<0.05) as compared to male cattle. With respect to organ specificity in 68 infected male cattle a frequency distribution of 38.24% (n=26) in lungs, 25.00% (n=17) in liver, 16.18% (n=11) in lungs and liver situs, 5.88% (n=4) in spleen and 4.71% (n=10) in abdominal and thoracic cavity was observed. While in 135 infected female cattle a frequency distribution of 42.22% (n=57) in lungs, 26.67% (n=36) in liver, 21.48% (n=29) in lungs and liver in situs, 3.70% (n=5) in spleen, 5.93% (n=8) in abdominal and thoracic cavity was recorded. According to cumulative organ specificity among 203 infected cattle, 83 (40.89%) lungs, 54 (26.11%) liver, 40 (19.70%) lungs and liver in situs, 9 (4.43%) spleen, and 18 (8.87%) abdominal and thoracic cavity were harbouring cysts.

A total economic loss due to hydatidosis in cattle was estimated as Rs.0.2 million/year i.e. Rs.1.39 per animal/year.

Introduction
Hydatidosis in the larger ruminants remained a significant health problem in many regions of the northern and southern hemispheres of the global village 1. Echinococcosis, the larval stage of hydatidosis is an endemic disease in sheep raising communities, caused by the larval or cyst stage of the tapeworm Echinococcus granulosus (2It affects a large number of animals and humans, especially in third world countries 3. In animals hydatid cyst may be found in almost any part of the body but most often in the liver and lungs. Other organs may include brain, muscles, kidneys, bones, heart and pancreas 4. Definitive hosts are canids, mostly dogs, where worm grows to adulthood in several months. The eggs are passed out along the fecal material and scattered in the pasture by wind and water which are ingested by various hosts. The eggs may survive several months outside the body, depending on the ambient temperature. Eggs die in nature because they cannot resist desiccation and extreme weather conditions. When these eggs are ingested by the intermediate hosts like cattle, sheep, goat, buffalo and human, the larva migrate through the intestinal wall and penetrate the organs, mostly liver and lungs 5

Materials and Methods
The present study was initiated in 1999 to better understand the clear picture about the prevalence of hydatidosis in cattle slaughtered during the period of 1999-2003. Different abattoirs of Lahore metropolitan including Bakkar Mandi, Shahdra, ArmyI, ArmyII and Baghbanpura were visited and the postmortem examination of 3158 cattle comprising of 1305 male and 1853 female was conducted. Each abattoir was visited once a week because the slaughter house working days are from Thursday through Monday each week round the year. Only adult animals slaughtered were examined in hanging position after removal of hide. Then only the infected organs liver, lungs, spleen, heart, kidney, were removed from the carcass and examined at the spot for the presence of hydatid cysts. Livers were inspected by cutting the left lobe with a number of small cuts and both surfaces were examined by palpation and incisions and spleens were examined through visual inspection.
The epidemiological investigation of hydatid cysts in different organs located in abdominal and thoracic cavity was carried out.

**Results**

The results of the present study provided the database on epidemiological parameters including prevalence, seasonal distribution, and secular trends about organ specificity of hydatidosis during 1999 to 2003. The prevalence was recorded as 6.43 % (203). In male it was 5.21 % (68) out of 1305 cow bulls and females it was 7.29 % (135) out of 1853 female cows. The rate of prevalence was significantly higher (p<0.05) in females than in males. The hydatidosis in cattle was 6.50 %, 5.70 %, 6.57 %, 5.59 %, 7.92 %, for the years from 1999 to 2003 respectively. The organ specificity from 1999 to 2003 in 203 cattle was 40.89 % (83) lungs, 26.11 % (53) liver, 19.70 % (40) lungs and liver in situ, 4.43 % (9) spleen, 8.87 % (18) in abdomen and thoracic cavity and nothing was found in heart and kidney.

Table 1. Showing organ specificity of hydatid cysts in male and female cattle (cows) in a random of five abattoirs of Lahore for 1999 to 2003.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Examined and found infected No (%)</th>
<th>Lungs infected No (%)</th>
<th>Liver infected No (%)</th>
<th>Lungs &amp; liver infected No (%)</th>
<th>Spleen infected No (%)</th>
<th>Abdomen &amp; Thoracic Cavity infected No (%)</th>
<th>Mean±S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>68(1.20)ª</td>
<td>26(38.40)c</td>
<td>17(25.00)a</td>
<td>11(16.18) e</td>
<td>4(5.88)f</td>
<td>10(14.71) e</td>
<td>14.31±5.30</td>
</tr>
<tr>
<td>Female</td>
<td>135(4.27)b</td>
<td>57(42.22)c</td>
<td>36(26.67)c</td>
<td>29(21.48)c</td>
<td>5(3.70)f</td>
<td>8(5.93)e</td>
<td>14.29±6.12</td>
</tr>
<tr>
<td>Total</td>
<td>203</td>
<td>83(40.89)</td>
<td>53(26.11)</td>
<td>40(19.70)</td>
<td>9(4.43)</td>
<td>18(8.87)</td>
<td>14.30±3.89</td>
</tr>
</tbody>
</table>

P<0.05 (Different superscripts are statistically different.

Table 2. Seasonal prevalence:

<table>
<thead>
<tr>
<th>Period</th>
<th>Summer (May-Sep)</th>
<th>Autumn (Oct-Nov)</th>
<th>Winter (Dec-Feb)</th>
<th>Spring (Mar-Apr)</th>
<th>Mean±S.E</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>7.11</td>
<td>6.36</td>
<td>5.59</td>
<td>6.61</td>
<td>6.42±0.31ª</td>
</tr>
<tr>
<td>2000</td>
<td>5.42</td>
<td>5.50</td>
<td>5.62</td>
<td>6.47</td>
<td>5.75±0.24ª</td>
</tr>
<tr>
<td>2001</td>
<td>6.11</td>
<td>7.50</td>
<td>5.26</td>
<td>8.65</td>
<td>6.88±0.75ª</td>
</tr>
<tr>
<td>2002</td>
<td>4.95</td>
<td>5.82</td>
<td>6.85</td>
<td>4.62</td>
<td>5.56±0.50ª</td>
</tr>
<tr>
<td>2003</td>
<td>6.55</td>
<td>10.78</td>
<td>8.45</td>
<td>7.40</td>
<td>8.29±0.91ª</td>
</tr>
</tbody>
</table>

P>0.05 superscripts have no statistical difference.

**Discussion**

The object of this study was to elucidate the factors about the disease transmission which is essential for its control in a particular country or region. A central control system which appears adequate for a combination of epidemiological variables in one country may not necessarily be appropriate to another country. For this reason, adequate local epidemiological studies must be carried out before any
serious efforts are made at hydatid disease control. The results of the present studies provide baseline data on epidemiological intelligence including sexes, prevalence, seasonal variations and organ specificity.

In the present investigation the overall prevalence of hydatidosis in cattle was 6.25 %. In Pakistan, prevalence of hydatid disease in domestic ruminants has also been studied at different occasions. Pal and Jamil 10 studied prevalence of hydatid disease in Rawalpindi, Pakistan abattoir. They reported 31.05 % cattle to be suffering from hydatidosis. The prevalence of hydatid disease in food animals slaughtered at Faisalabad abattoir was studied and reported that 33 % cattle to be infected with hydatid cysts 7. These results do not match with the author because studies were conducted about 15 to 20 years back. This difference was due to small sample size and data was collected only from one abattoir and further more only three months data was compiled. Prevalence of hydatidosis was studied by Abel 6 in 171 adult cattle and nine stray dogs. Hydatidosis was reported 20.5 %in cattle. Ansari 8 reported 85.71 % infection rate in older yaks. These results differ from present study to small sample size and geographic variations. The observed data also showed that female animals were more susceptible for infection as compared to male. The prevalence in females may be correlated to the fact that the females were kept for reproductive purpose for longer time and most of males were slaughtered at an early age. In 1989-1993 hydatidosis was confirmed to 304 slaughtered cattle in Australia, of which 67 % were female and 33 % were male animals. The disease was confirmed in 304 cattle, of which 98 % were adult 7. The results were similar to the present study where the females were highly infected than male.

References