Prevalence of helminth parasitic diseases in industrial abattoir in Ilam province, western Iran

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Most of the parasitic diseases are significantly important in the aspect of economic as well as public health. This retrospective study aims to investigate and provide data on the prevalence, epidemiological pattern and zoonotic impact of helminth parasites in animals slaughtered at industrial abattoir in Ilam Province, Western Iran. In this present study, a total of 27242 indigenous animals including 17055 sheep, 5703 goats, and 4484 cattle were analyzed. 27242 animals were slaughtered at the abattoir, hydatid cysts were observed in 2.38 percent (650 cases including 328 sheep, 94 goats and 228 cattle) in liver and 2.76 percent (753 cases including 396 sheep, 99 goats and 258 cattle) in the lungs. Prevalence of Fasciola hepatica and Dicrocoelium dendriticum was recorded in 0.98 percent (267 cases including 98 sheep, 28 goats and 141 cattle) and 0.44 percent (120 cases including 88 sheep, 28 goats, and 4 cattle), respectively. Eighty cases (0.29%) were infected with Cysticercus. This present parasitic investigation concluded that the prevalence of parasites were high in Ilam Province abattoir, which causes economic losses to the nation resulting from the loss of livestock and their products. Further, human beings are more prone to infection from infected food animals.

Key words: Abattoir, prevalence, helminthes, zoonotic parasites, economic loss.

INTRODUCTION

Most of the parasitic diseases are significantly important in the aspect of economic as well as public health. Several infectious diseases classified as zoonotic parasitic diseases transmitted from animals to humans (Abdi et al., 2010; Rokni 2008). Because of the lack of right surveillance systems, accurate estimates of economic losses and health damage due to food-borne parasitic diseases in the world are not possible (Chai 2009). Hydatid cyst, larval stage of Echinococcus granulosus, is one of the helminth zoonotic diseases that not only involves animals but also considered as a major health problem in many countries (Yang et al., 2009). Infection of dogs with E. granulosus, in different provinces in Iran is between 2.2% to 63.2%, and in the wild carnivores in some areas of Iran is more than 20% (Rokni, 2009; Sadjjadi 2006; Sarkari et al., 2009). Several slaughtered based studies report from 1% to 70% of animal infection to hydatidosis (Ghazani et al., 2008; Rokni, 2009; Sadjjadi, 2006; Zariffard and Khajeh, 2000).

Other common helminth parasitic diseases of humans and animals are liver trematodes named Fasciola hepatica and Dicrocoelium dendriticum. They live in the bile duct of humans and ruminants and infection in human led to health issues in society and in cattle causes enormous economic losses (Moulazadeh and Zohoor 2004; Youn, 2009). The parasites considered as an important source of losing protein in animals (Movassagh Ghazani et al., 2008; Zuko, 2011). For example, economic losses due to infection with F. hepatica estimated as 5.5 million dollars in the USA (Zheng et al., 2009).

Cysticercus is the larval stage of the taeniidae cestodes that afflicts the muscles of animals. The adult worms
Table 1. Prevalence of helminth diseases amongst animals slaughtered in abattoir in Ilam.

<table>
<thead>
<tr>
<th>Disease condition</th>
<th>Infected Cattle n (%)</th>
<th>Infected Sheep n (%)</th>
<th>Infected Goat n (%)</th>
<th>Total infected n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liver hydatid cyst</td>
<td>228(5.08)</td>
<td>328(1.92)</td>
<td>94(1.64)</td>
<td>650(2.38)</td>
</tr>
<tr>
<td>Lung hydatid cyst</td>
<td>258(5.75)</td>
<td>396(2.32)</td>
<td>99(1.73)</td>
<td>753(2.76)</td>
</tr>
<tr>
<td>Dicrocoelium dendriticum</td>
<td>4(0.08)</td>
<td>88(0.51)</td>
<td>28(0.49)</td>
<td>120(0.44)</td>
</tr>
<tr>
<td>Fasciola hepatica</td>
<td>141(3.14)</td>
<td>98(0.57)</td>
<td>28(0.49)</td>
<td>267(0.98)</td>
</tr>
<tr>
<td>Cysticercus</td>
<td>3(0.06)</td>
<td>50(0.29)</td>
<td>28(0.49)</td>
<td>81(0.29)</td>
</tr>
</tbody>
</table>

Table 2. The seasonal prevalence of helminth infection in animals slaughtered in industrial slaughterhouse of Ilam.

<table>
<thead>
<tr>
<th>Season</th>
<th>Animal</th>
<th>Number</th>
<th>Fasciola hepatica</th>
<th>Dicrocoelium dendriticum</th>
<th>Liver hydatid cyst</th>
<th>Lung hydatid cyst</th>
<th>Cysticercus spp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>Sheep</td>
<td>6318</td>
<td>31</td>
<td>16</td>
<td>98</td>
<td>102</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>Cattle</td>
<td>1175</td>
<td>49</td>
<td>2</td>
<td>77</td>
<td>92</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Goat</td>
<td>1783</td>
<td>11</td>
<td>2</td>
<td>28</td>
<td>28</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Sheep</td>
<td>2974</td>
<td>20</td>
<td>15</td>
<td>81</td>
<td>105</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Cattle</td>
<td>1177</td>
<td>36</td>
<td>1</td>
<td>47</td>
<td>60</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Goat</td>
<td>1643</td>
<td>7</td>
<td>13</td>
<td>24</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td>Summer</td>
<td>Sheep</td>
<td>3517</td>
<td>17</td>
<td>26</td>
<td>69</td>
<td>87</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Cattle</td>
<td>1039</td>
<td>36</td>
<td>1</td>
<td>59</td>
<td>59</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Goat</td>
<td>1371</td>
<td>4</td>
<td>7</td>
<td>24</td>
<td>26</td>
<td>9</td>
</tr>
<tr>
<td>Autumn</td>
<td>Sheep</td>
<td>4368</td>
<td>30</td>
<td>31</td>
<td>80</td>
<td>94</td>
<td>15</td>
</tr>
<tr>
<td>Winter</td>
<td>Sheep</td>
<td>1903</td>
<td>20</td>
<td>0</td>
<td>45</td>
<td>47</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Cattle</td>
<td>906</td>
<td>6</td>
<td>6</td>
<td>18</td>
<td>14</td>
<td>9</td>
</tr>
</tbody>
</table>

have been found in the small intestines of humans, dogs, cats, mice and wild carnivores, such as wolf and fox (Abidi et al., 1989). The economic damage caused by infection with *Cysticercus* is high due to the condemnation of infected carcasses and the necessity to freeze or boil infected meat (Sissay et al., 2008).

Considering the geographic location of Ilam city and the nomadic life in this area, there is always the danger of spreading the helminth zoonotic diseases. Due to lack of awareness of the diseases in the region, this present study reviewed the epidemiological status of parasites of animals slaughtered in the industrial slaughterhouse of Ilam, western Iran.

**MATERIALS AND METHODS**

**Geographical area**

Ilam Province is nearly 23,666 square kilometers and located the West of Iran. This area located the south of Kermanshah, north of Khuzestan, east of Iraq and west of Lurestan. In the aspect of geography most areas of the province, especially in the north composed from hills and mountainous lands. About job of the people, pastoral is one of the most important jobs. According to the Census, Statistical Center of Iran, the population of Ilam city was equal to 563898 in 2006 and 30% of the population are nomads.

**Animal and sample collection**

Meat inspection records in a slaughterhouse located Ilam, during a 1-year period from January to December 2011 used to found prevalence of helminth parasites in sheep, cattle, and goats in the region. This study was a descriptive-retrospective one with a population under study as animals slaughtered at industrial slaughterhouse of Ilam. The study conducted on 27242 animals, including 17055 sheep, 5703 goats, and 4484 cattle. Required information extracted from the records by researcher and analyzed by SPSS 16 software and descriptive statistics.

**RESULTS**

Overall, 6.93% of examined animals had helminth parasitic infection. Table 1 shows the animal prevalence and Table 2 shows the seasonal prevalence of parasites. Prevalence of liver and lung hydatid cyst was 2.38 % as well as 2.76%, respectively. Prevalence of *F. hepatica*...
and *D. dendriticum* was 0.98% as well as 0.44% respectively. 81 (0.29%) cases were infected with Cysticercus (Table 1). As stated in Table 2 the highest prevalence of parasites was seen in spring.

Discussion

The data obtained in this paper give valuable information about the presence of helminth parasitic diseases in indigenous slaughtered animals including sheep, goats, and cattle in Ilam Province. This shows that the transmission cycle of the parasites is active in the region and it causes the risk of human infection.

About prevalence of the parasites in Iran, in one study, prevalence of hydatid cyst, fasciolosis and dicroceliosis has been reported 12.3%, 4.9 and 6.5, respectively, in Hamadan (Fallah et al., 1992). In another study, prevalence for *F. hepatica* has reported 9% in animals slaughtered in Yasuj industrial abattoir. Despite the similar weather in Ilam, Yasuj and Hamadan the prevalence observed seems to be different. Perhaps this is because of the most common jobs of Yasuj and Hamadan people who are nomadic or drought in recent years in Ilam.

Outside Iran, prevalence of helminth parasites have been reported 4.67% in cattle and 3.85 in sheep for *D. dendriticum*, 5.45 in cattle and 4.42 in sheep for *F. hepatica* and 9.1 in sheep and 7.6 in cattle for hydatid cyst, in Turkey (Murat et al., 2009). In another study, from a total of 4481 slaughtered cattle examined at Mekelle industrial slaughterhouse, 357 (8%) infected with hydatidosis and fasciolasis, while the animal prevalence of hydatidosis and fasciolosis was 32.11 and 24.32%, respectively (Gebretsadik et al., 2010).

There are also reports about prevalence of cysticercosis across the world. For example, Prevalence of cysticercoids in Jimma town reported as 4.4% in animals (Tolosa et al., 2009) and infection due to *Cysticercus bovis* in Kano abattoir located Fagge local government area (LGA) of Kano state, Nigeria was 315 (2.67%) (Rabiu and Jegede 2010) that in comparison with this present study, the infection rate of cysticercus was high. Comparison of results of this present study with above studies, outside as well as inside Iran, shows the infection rate of helminth parasitic disease in the region is different from across the world. This indicated that the distribution of parasites does not follow the same pattern throughout the world.

Another finding of this study is the low prevalence of hydatid cysts and liver trematodes in goats in comparison with cattle and sheep. Probably this is caused due to resistant of goats to helminthes or the difference in their nutritional behavior.

About seasonal prevalence, in this study the highest and lowest prevalence of helminthes parasites was seen in spring and winter, respectively. While in comparison with this study, the highest prevalence rate of *fasciola hepatica* reported in winter in Yasuj, Iran. This shows that the seasonal incidence of parasites also does not follow the same pattern.

Economic damage caused by omitting infected organs in a five-year period in Iran, is estimated as almost 17 million US dollars, and average prevalence of human hydatidosis during the years 2002 to 2007 as 0.61 per 100,000 people (Tavakoli et al., 2008). In conclusion, Regardless of human infection, in the abattoir of Ilam in one year 650 liver and 753 lungs demolished due to helminth infections. The average market price is 20 US dollars for liver and 10 for lung in Iran. Therefore, the economic damage caused by omitting infected organs in a one-year period in the region estimated as about 20530 US dollars. It is understood that helminthes disease are present in the region and there is always an outbreak risk of helminthes disease.

Acknowledgment

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REFERENCES


