STUDY OF THE INCIDENCE RATE OF LIVER AND LUNG HYDATIDOSIS IN SLAUGHTERED CATTLE AND BUFFALOES, AT AHAR ABATTOIR (ARASBARAN REGION – NORTHWESTERN IRAN) DURING 2007-2008

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ABSTRACT

Since recent researches on hydatidosis in Iran has reported high infection rates (particularly in the west and northwest regions), this study was done to evaluate the incidence rate of hydatidosis in slaughtered cattle and buffaloes of Ahar abattoir (Arasbaran Zone-northwestern Iran) and compare the results with previous researches in the other regions of Iran. During the one-year evaluation of abattoir data from among 5885 slaughtered cattle and 411 buffaloes, 1570 lungs and 637 livers of cattle (37.5%), and 75 lungs and 56 livers of buffaloes (31.87%) were infected by hydatid cysts. The most infected tissue was lung in both animals. The infection rate of slaughtered cattle at Ahar abattoir was the highest compared with the infection rates of other regions of Iran (based on the statistics of published research). By reviewing the present study and statistics of other researches, it is observed that, the hydatidosis rate in the west and northwest of Iran is greater than the rate in the central part, and the main infected tissue is lung.

Keywords: hydatidosis, cattle, buffalo, abattoir, Iran

INTRODUCTION

Information resulting from meat inspection records has been used as useful sources for evaluation of the epidemiological aspect of certain diseases in several countries (Mirani et al., 2000; Umur et al., 2003; Ansari-Lari, 2005). Among diseases which are not apparent to farmers but are of considerable economic and public health importance is hydatidosis.

Hydatidosis is the infection of intermediate hosts by the larval form of Echinococcus granulosus. Hydatidosis of livestock animals results in decreasing by their production (meat, wool and milk) and thereby causes high economic loss (Umur et al., 2003). Furthermore, the infected organs of the slaughtered animal are condemned. Since hydatidosis is a zoonotic disease, and it is a matter of health, concern, in many countries there are special programs to control and eradicate the disease.

The reports show high incidences of hydatidosis in animals of the Mediterranean and Middle East (Battelli et al., 2002; Sadjjadi, 2006). In Iran, hydatidosis is one of the major infectious zoonotic diseases where sheep, cattle, buffaloes and goats are still slaughtered traditionally and carcass wastes are easily accessible to vagrant dogs and other wild carnivores (Eslami et al., 1998). The high incidence rate because of adult form of E. granulosus in dogs may be associated with high environmental contamination. As a result, human and mammals, who are intermediate hosts of E. granulosus, are under high risk of the disease. For example, a 55.7% infection rate has been reported in Kashan (central Iran) dogs by Arbabi and Hooshyar (Eslami et al., 1998; Ozcelik, 2001; Arbabi et al., 2006).

Abattoir based reports, indicate that the infection rate of hydatidosis in cattle in the western part of Iran is considerably nigher than in the centaral part of Iran (Dalimi et al., 2004; Akhlaghi et al., 2006).
There are few reports of buffalo hydatidosis, which has been shown to have a high incidence of disease in the west and northwest of Iran (Dalimi et al., 2002; Khanmohammadi et al., 2008). Ahar abattoir is located in the northwest of Iran in the Arasbaran zone, and animals of five suburb cities are taken there in order to be slaughtered. High incidences of cattle and buffaloes hydatidosis in the west and northwest of Iran and the lack of any report about the infection rate of disease in this zone (Arasbaran) made it imperative for us to study the hydatidosis of cattle and buffaloes, slaughtered at Ahar abattoir.

**MATERIALS AND METHODS**

**Data collection**

This study was conducted from March 20, 2007 to March 19, 2008. During the study, the daily number of hydatid infected livers and lungs of cattle and buffaloes slaughtered at Ahar (Northwestern Iran- Arasbaran zone) abattoir were recorded. To be sure about the validity of recorded data, observed data were collected daily. While recording the number of infected organs, other information on the carcass, including its sex and species, was recorded too.

**Statistical Analysis**

Abundance and percentage of recorded data, and the relation between gender and infected organ, and the relation between species and infected organ which are presented in the results, were calculated using chi-square tests in SPSS software (Version14).

**RESULTS AND DISCUSSION**

During the one-year period of study from 20 March 2007 to 19 March 2008, a total of 6296 animals (cattle and buffaloes) were slaughtered of which 4419 were male and 1877 were female. In this period of study, a total of, 693 (11%) of livers and 1645 (26%) of lungs were infected with hydatidosis. Animal, sex, and infected tissue cross-tabulation of collected data is presented in Table 1. Prevalence rates for hydatidosis infection during this study are shown in Table 2.

Season-by-season review of recorded data confirms that the hydatidosis rate in summer is at the highest rate (809 organs) and in winter is at the lowest rate (292 organs).

Evaluating the relation between the cattles’ gender and infected organs, it was found that there is a significant relation between animal gender and infection of lung by hydatid cyst (p<0.01) but there was no significant relation between cattle gender and infection of liver by hidatid cyst (p>0.01).

Evaluating the relation between buffalo’s gender and infected organs showed that there was a significant relation between buffalo’s gender and infection of lung by hydatid cyst (p<0.01) and there was also a significant relation between animal gender and infection of liver by hidatid cyst (p<0.01).

Evaluation of the relation between animal species and infected organ. Showed a significant relation between animal type and infection of lung by hydatid cyst (p<0.01) while there was no significant relation between animal type and infection of liver by hydatid cyst (p>0.01).

Hydatidosis causes considerable economic loss in livestock due to condemnation of organs (Ansari-Lari, 2005). Consequently, available information about its epidemiologic aspects must be prepared for future researches. Furthermore, a close contact should be developed between farmers and abattoir, so that farmers are informed about the disease incidence rate for more effective preventive measures.

There are different ranges of cattle hydatidose data published, which are from 3.5% to 33.83% (Dalimi et al., 2002; Akhlaghi et al., 2005; Arbabi et al., 2006; Fakhar et al., 2007). In this study, the infection rate of hydatidosis in cattle was 37.5%, which is higher than the reports of the other parts of Iran. According to the results of this study and statistics reported from different parts of Iran (Table 3), there is a considerable difference between the infection rate in the central part (mean: 4.2%) and the western part (mean: 28.28%) of Iran.
As to the infected organs in cattle, the highest rate in central and southwest of Iran is of the liver (Fakhar et al., 2007), while in the western part of Iran, lung is the most infected organ (Dalimi et al., 2004) of cattle. Also in this study, the lung was the most infected organ of slaughtered cattle, the rate being twice that of liver in infection.

Hydatidosis of slaughtered buffaloes was at a high rate, too. In 1998, based on a study in India, the infection rate in the northern part of India was reported to be 48.1% (Singh et al., 1998). Reported statistics from East Asia show a low rate of hydatidosis in Nepal (6.8%) (Manadhar et al., 2006). Statistics on hydatidose of Italian buffaloes (Mediterranean) was reported as 10.6% (Capuano et al., 2006). Unfortunately research in recent decades shows high rates of hydatidosis infection in the Middle East varying between 12.4% and 31.8% (Mirani et al., 2000; Dalimi et al., 2002; Khanmohammadi et al., 2008). Considering the statistics of this study (31.87%) and research of Khanmohammadi et al., 2008 (Tabriz abattoir, 25.74%) which were both done at the same period of time, and comparing them with recent reports published from various regions and countries such as (Italy, southeast Asia and the western part of Iran), it is obvious that the western part of Iran has the highest rate of infection of buffaloes by hydatidosis.

Evaluating the organs of slaughtered buffaloes infected by hydatid cysts, 18.2% were of the lung and 13.6% were of the liver. The main infected organ in our study, the same as the researches of Italy (Capuano et al., 2006) and Nepal (Manadhar et al., 2006), was the lung while studies in Pakistan And Tabriz abattoir (Iran), reportesd the liver as the most infected organ.

Overall, when considering the statistics of this study and comparing them with previous reports, it is found that the hydatidosis infection rate in slaughtered cattle and buffaloes of the Arasbaran zone is at the highest in Iran. Dalimi, et al. (2002), who studied hydatidosis in five provinces of Iran in the west and northwest, reported that the infection rate in lungs was three times that in livers.

According to this study at Ahar abattoir and the research of Dalimi et al. (2002) in five provinces of Iran, it was found that the main tissue of slaughtered cattle in the west and northwest of Iran was the liver.

**CONCLUSION**

It is recommended that, due to the high rate of hydatidosis in animals of the northwest of Iran, designing a surveillance program followed by hygienic measures can be useful in reducing the

<table>
<thead>
<tr>
<th>Animal</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow</td>
<td>Liver</td>
<td>446</td>
<td>1545</td>
</tr>
<tr>
<td></td>
<td>Lung</td>
<td>1099</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>637</td>
<td>2207</td>
</tr>
<tr>
<td>Buffalo</td>
<td>Male</td>
<td>42</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>54</td>
<td>131</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>56</td>
<td>131</td>
</tr>
</tbody>
</table>
incidence rate of the disease. Program must based on making pastures safe from vagrant carnivores while prevention measures against parasitic disease such as *E. garanulosus* must be implemented in flock dogs. However it is obvious that anti-parasitic measures should be undertaken simultaneously in domestic pets too. Furthermore, the infected organs (lung and liver) of slaughtered animal in abattoirs should be destroyed to keep them out of the reach of wild carnivores.

**ACKNOWLEDGEMENTS**

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Table 2. Infection rate of animal hydatidosis at Ahar Abattoir.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Cattle</th>
<th>Buffalo</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspected</td>
<td>5885</td>
<td>411</td>
<td>6296</td>
</tr>
<tr>
<td>Infected Liver</td>
<td>637</td>
<td>56</td>
<td>693</td>
</tr>
<tr>
<td>Infected Lung</td>
<td>1570</td>
<td>75</td>
<td>1645</td>
</tr>
<tr>
<td>Total Infection Rate</td>
<td>37.5%</td>
<td>31.87%</td>
<td>34.68%*</td>
</tr>
</tbody>
</table>

*-This value is mean of cattle and buffalo infection rate.

Table 3. Infection rate of hydatidosis in cattle of the different part of Iran.

<table>
<thead>
<tr>
<th>Zone</th>
<th>Infection rate in cattle (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanandaj (west)</td>
<td>28.2</td>
</tr>
<tr>
<td>Shiraz (south west)</td>
<td>3.2</td>
</tr>
<tr>
<td>Ilam (west)</td>
<td>33.83</td>
</tr>
<tr>
<td>Qom (central)</td>
<td>3.5</td>
</tr>
<tr>
<td>Kashan (central)</td>
<td>4.0</td>
</tr>
<tr>
<td>Kerman (south)</td>
<td>7.2</td>
</tr>
</tbody>
</table>
REFERENCES


