Comparative Prevalence Study of Bovine Fasciolosis in Ambo Town Based on Habitat of Intermediate Host Snail

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Abstract: Cross sectional study was conducted in and around Ambo town starting from February to June 2015 to determine the prevalence of bovine Fasciolosis in Awaro (swampy) and Senkele (non-swampy) Kebeles. From the total 150 examined cattle for fasciolosis in the study area the overall prevalence of bovine Fasciolosis was 47.3%, n= 71 cattle were identified as positive from both swampy and non-swampy areas. Furthermore, this study indicated that higher prevalence (with strong statistical significance) was recorded in swampy area (Awarokebele) than that of non-swampy area (Senkelekebele) with prevalence rate of 75% (n=63) and 12.1% (n=8) respectively. However, there were no significant difference between age group, sex and breed (p>0.05).

Key words: Prevalence • Bovine fasciolosis • Coprology • Ambo town

INTRODUCTION

Fasciolosis is economically important disease of domestic livestock particularly cattle and sheep and occasionally man. It is caused by trematode of the genus Fasciola, commonly referred to as liver fluke. The two species which are an etiological agent of fasciolosis are *Fasciola hepatica* and *Fasciola gigantica*. *F. hepatica* that have a world-wide distribution but predominates in temperate climatic zone while *F. gigantica* is found on most continents, primarily in tropical regions [1]. Ethiopia which is believed to have the largest livestock population in Africa, with an estimated population of 7.8 million of equine, 1 million of camels, 476.5 million cattle, 39.6 million chickens, 26.1 million sheep and 21.7 million goats [2]. However, their productivity is very low as a result of disease, malnutrition and management problem. Fasciolosis is one of the most major parasitic diseases contributing low productivity of livestock [3]. Fasciolosis is known by different local names in various parts of Ethiopia that vary according to the region and language. Fasciolosis caused by *F. hepatica* and *F. gigantica* is one of the most prevalent helminth in the infections of ruminants in different distinct of Ethiopia including Ambo town resulting significant morbidity and mortality [5].

The life cycle of these trematodes involves snails of the genus *Lymnaea* as an intermediate host. Infection with *Fasciola* species is usually associated with grazing in wet land and drinking from the snail infested watering places. *F. hepatica* and *F. gigantica* are the two liver flukes commonly reported in ruminants [6].

The spread of fasciolosis to new area depend upon the spread of host snails, expansion and establishment of new dams, new water ponds and infected animals. Location of the snail habit is an important factor in control program. It is also an important to note that out-break of fasciolosis does not occur in the absence of intermediate host. Fasciolosis is one of the most common diseases which lead to economic loss directly or indirectly in Ambo town because it has a geographical area which is favorable for prevalence of fasciolosis. The situation such as high swampy areas favors the occurrence of fasciolosis [7]. However, due to lack of information concerning epidemiological or prevalence of bovine fasciolosis of Ambo town the present study was proposed with the following objective.

- To determine the prevalence of the fasciola infection in cattle based on habitat of intermediate host snail.
- To investigate the prevailing risk factor for fasciola infection at the study area.

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MATERIALS AND METHODS

Study Area: This study was conducted in Ambo town in Awaro and Senkelekebele which is found in west Shoa of Oromia regional state. Ambo town is located at a distance of 115 km from Addis Ababa. The altitude varies from 1900 m to 2275 m above sea level. The study area receives a mean annual rainfall of 900mm (800-100mm) and annual temperature ranging from 20°C to 29°C with average temperature of 24.5°C. The lowland, highland and middle land covers 17, 023 and 60 percent respectively. The majority of the cattle in Ambo town are local breed [8].

Study Design: Across sectional study was conducted to determine the prevalence of bovine fasciolosis and investigate risk factor of fasciolosis infestation in Ambo town.

Sampling Techniques: The study population was sampled by using systemic random sampling procedure according toToma et al. [9] and then fecal sample were taken once from each animal for laboratory procedures. Appropriate data was collected by using secondary data from Ambo veterinary clinic and laboratory tests by collecting feces to the lab and observe fasciola eggs by sedimentation method.

Fecal Examination: The study was conducted by collecting feces using glove through rectum and preserved by using formalin and brought to the lab, then processed it by sedimentation method which was done by weighing three gram (3g) of feces in to a beaker and poured 40-50ml of tap water into the beaker and mix thoroughly with stirring device and filter the fecal suspension through sieve and pour the filtered material into a test tube. Then allow to sediment for 5 min and remove or decant the supernatant very carefully and re-suspend the sediment in 5 ml of water. Allow to sediment for 5 minutes and transfer the sediment to the slide and cover with cover slip and examine at low power microscope [10].

Data Analysis: The data was analyzed by considering different risk factors which were thought to have effects on prevalence of fasciola. Descriptive statistics, percentages, 95% confidence interval and χ² test were applied to see the effects of different risk factors in comparing infected and non-infected animals. These were processed by SPSS package statistical significance was set at p<0.05.

RESULTS

From the total of 150 cattle examined 47.3% (n=71) were positive for fasciola and 75% (n=63) was recorded for swampy kebele (Awaro) while the least 12.1% (n=8) was recorded in Senkele (non-swampy) as described in Table (1) and Fig. (1).

There was statistically strong significant difference in the prevalence of bovine fasciolosis between Awaro (Swampy) and Senkele (non-swampy) kebeles (p = <0.001) but there were no statistically significant difference by sex (p = 0.937), age (p=0.426) and breed (p=0.631) which means fasciolosis prevalence was not affected by such risk factors other than considered study area (Table 2).

The secondary data result (questionnaire) of two year recorded in Ambo veterinary clinic a total of 68 cattle were suspected and treated for fasciola. Out of 68 suspected animal 45.6% (n=31) animal were brought to the clinic in spring while 27.9% (n=19), 16.2% (n=11) and 10.3 (n=7) case were observed in summer, autumn and winter respectively (Fig. 2). Of the total 68 cattle brought to clinic n=65 (95.6%) were found to be emaciated and the remaining n = 3 (4.4%) were good body condition apparently.

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>No of examined</th>
<th>No of positive (%)</th>
<th>χ²</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Swamy</td>
<td>84</td>
<td>63 (75)</td>
<td>58.61</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Local</td>
<td>140</td>
<td>71 (50.7)</td>
<td>0.231</td>
<td>0.631</td>
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<tr>
<td>Breed</td>
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<tr>
<td>Cross</td>
<td>10</td>
<td>4 (40.0)</td>
<td>0.006</td>
<td>0.937</td>
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<tr>
<td>Local</td>
<td>140</td>
<td>67 (47.9)</td>
<td>1.708</td>
<td>0.426</td>
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<tr>
<td>Sex</td>
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<tr>
<td>Female</td>
<td>84</td>
<td>40 (47.6)</td>
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</tr>
<tr>
<td>Male</td>
<td>66</td>
<td>31 (47.0)</td>
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<tr>
<td>Age</td>
<td></td>
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<tr>
<td>Calves</td>
<td>35</td>
<td>14 (40.0)</td>
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<tr>
<td>Young</td>
<td>62</td>
<td>33(53.2)</td>
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<tr>
<td>Adult</td>
<td>53</td>
<td>24 (45.3)</td>
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</table>

p < 0.05 (highly significant)

The proportional prevalence of fasciolosis by season from questionnaire.
DISCUSSION

The result of laboratory examination conducted in the study area indicated that the animals extensively managed were highly infected by fasciola. This is due to chance of high infection during free grazing from area. During the present study the overall prevalence for bovine fasciolosis in both swampy and non-swampy area were found to be 47.3%. Of this the prevalence of bovine fasciolosis in swampy was 75% and in non-swampy area was 12.1%. These indicate that the prevalence of bovine fasciolosis in swampy area was higher than non-swampy area. This was due to the vector availability in swampy area, which predisposes the animal to infection with fascioli. The present finding agrees with previous work [11] Malone, et al. who reported the prevalence of fasciolosis in Ethiopia that range from 11.5%-87%; Daniel [12] who reported the prevalence of fasciolosis in Dira Dawa which was 14.4%. This result was also similar with report of Yilma and Mesfin [13] 33.42% in North Gonder; 15.9% prevalence by Fufa et al. [14] at Nekemte veterinary clinic; Rahmeto Abebe 27.1% in Woliso, Abebe [15]; (28.63%) by Birhane [16] in Hawassa and Behablom in chora wereda (56.2%) [17].

However, is lower than (90.65%) reported by Yilma Jobre and Mesfin Ali, 2000 at Gondar abattoir [18]. The prevalence resulted by fecal examination in the present study was higher than reported from 4.9% in Soddo [19]. The lower prevalence resulted from non swampykebele n=8 (12.1%) might be due to the rapid action of immune system of the animal defense and sample taken from animal before incubation period was reached. There was high statistically significant difference in the prevalence of fasciolosis between study areas.

The result of retrospective data showed that the prevalence of fasciolosis vary by season although it can occur throughout the year. Relatively in the spring and summer the prevalence to fasciolosis were high. This was due to the prolonged incubation period, availability of suitable environment for vector multiplication. The prevalence of fasciolosis in spring, winter, autumn and summer were 45.6%, 10.3%, 16.2% and 27.9% respectively.

CONCLUSION

The present study conducted on bovine fasciolosis for four months in two selected kebeles of Awaro and Senkele in Ambo town showed that bovine fasciolosis is one of the most prevalent diseases in study area. Particularly the prevalence of fasciolosis was found to be higher in Awaero. However, the attention was not given to the disease prevalence so far in this study area. The swampiest of the area was significant contribution for high prevalence of the disease in study area.

Therefore, based upon the above conclusion the following recommendations are forwarded.

- The animal should be managed intensively if the area is swampy.
- Strategic treatment with appropriate, effective and broad spectrum anthelmints should be practiced at the beginning and after the end of rainy season.
- The field veterinarians and stockowners should be aware of the importance and burden of fasciolosis in Bovine.
- Eradication of the snails from area.
- Further detail epidemiological and seasonal studies should be carried out so as to design appropriate control strategies in the area.

REFERENCES