Prevalence of Fasciolosis and Paramphistomosis in Dairy Farm and House Hold in Hawassa Town

Tagesse G. Mariam, Abdu Mohamed, Nuradis Ibrahim and Dereje Baye

Jimma University College of Agriculture and Veterinary Medicine, P.O. Box: 307 Jimma, Ethiopia

Abstract: Fasciolosis and Amphistomosis (Paramphistomosis) are two important parasites of farm livestock. A cross-sectional study was conducted to study bovine fasciolosis and Paramphistomosis in dairy cattle at Hawassa dairy farm and house hold from November 2010 to March 2011 with the aim to investigate the current prevalence by using sedimentation technique. A total of 384 cattle were randomly selected from the study population and out of the total examined 11.5% and 6.7% cattle were positive for fasciolosis and Paramphistomosis respectively. The recorded fasciolosis prevalence was varying in age (young 10.7% and adult 12.1%), sex (female 11.0% and male 30.0%) and body condition (good 6.5% and poor 48.9%) was recorded and the prevalence of Paramphistomosis varying in age (young 5.6% and adult 6.3%), sex (female 5.9% and male 10.0%) and body condition (good 1.8% and poor 37.8%) was recorded. In infection rate in different age and sex of animal showed no statistical significance (P>0.05) but in infection rate in different body condition of animal showed statistical significance at (P<0.05). Finally, a few point of recommendation was forwarded to alleviate the problem of fasciolosis and Paramphistomosis in the area.

Key words: Hawassa · Dairy Farm · Bovine · Fasciolosis · Paramphistomosis · Prevalence

INTRODUCTION

Helminthe infections are important causes of lost productivity in live stock worldwide often necessitating anthelmintic treatment [1]. Fasciolosis and Amphistomosis (Paramphistomosis) are two important parasites of farm livestock [2]. Fasciola gigantica is the most common fasciola species found in Africa and Asia [3] and is widely distributed in tropical and subtropical areas, where it is recognized as a major source of production losses in domestic ruminants [4, 5 and 2]. Bovine fasciolosis is an economically important parasitic disease of cattle caused by Fasciolidae, which are trematodes, of the genus Fasciola. The two most important species of this genus are F. hepatica and F. gigantica. The presence of fasciolasis due to F. hepatica and F. gigantica in Ethiopia has long been known and its prevalence and economic significance have been reported by several workers [6, 7, 8 and 9]. The economic losses due to fasciolosis are caused by mortality, morbidity and reduced growth rate, condemnation of liver, increased susceptibility to secondary infections and the expense of control measures [10].

Diagnosis is based primarily on the clinical signs and examination haematological tests and examination of faeces for fluke eggs are useful [11]. Helminth parasites, especially GI parasitism, are one of the major health problems severely limiting the production losses, which may run in to millions of rupees [12]. Fasciolosis causes major financial losses in sheep, goat, buffaloes and cattle [13]. Besides its great veterinary importance throughout the world, fasciolosis has recently been shown to be a re-emerging and wide spared zoonosis affecting a number of human populations [15]. While the epidemiology and economic losses of fasciolosis are well known in most countries but Amphistomosis is still a neglected helminthe infection in many countries and the parasites are sometimes considered to have no effect on animals [16, 2 and 17]. However Amphistomes can limit livestock productivity and account for high economic losses [18] in cattle [19] and immature flukes cause disease [16, 20 and 19]. The most important species responsible for out breaks of acute amphistomosis in ruminants in Africa is P. microbothrium [16, 20]. Data on the prevalence of Amphistomes are scarce, even from Europe [21, 22].
A recent study conducted in Iringa district of Pakistan indicated a high prevalence of *Fasciola gigantica* and Amphistomum (*Calicophoron microbathroom* and *P. jacksoni*) in grazing cattle [17]. For rational and sustainable helminthe control programmed a compressive knowledge of the epidemiology of parasites and their interaction in the host in a specific climate and management system is a pre requisite [23]. Therefore, the objective of this study was to determine the prevalence of bovine fasciolosis and Paramphistomosis in dairy cattle based on the coproscopy examination in Hawassa town.

**MATERIALS AND METHODS**

**Description of the Study Area:** The study was conducted in Hawassa town from November-March, 2010/2011. Hawassa town is the capital city of Sidama zone and SNNPR, which is located in the northern part of SNNPR and 275 km south of Addis Ababa. Geographically it lies between 4°27’ and 8°30’N latitude and 34°21’ and 39°1’E longitude at an altitude of 1790 m.a.s.l. The area annually receives an average of 800-1000 mm rain fall of which 67% falls in long rainy season which extends from June to September. During the study period the mean minimum and maximum temperature of the area was 20.1°C and 30°C respectively and mean relative humidity was 51.8%. The area is mainly covered by dry savanna and bush type of vegetation [24]. The total livestock population of Sidama zone (including Hawassa) is estimated to constitute 1,721,341 cattle, 228,941 goats, 457,465 sheep, 57,643 horses, 54066 donkeys, 725,540 poultry and 44,492 beehives [25].

**Study Animals:** The study animals were either in the dairy farm or in the household from different kebele found in Hawassa town. Then, individual cattle were selected using simple random sampling method and they were arranged according to their age, sex and body condition.

**Sample Size Determination:** The study was a cross-sectional type and the sample size was determined considering prevalence of 30.4% [26] for fasciolosis and expected prevalence of 50% for Paramphistomosis. The formula given by [27] with 95% confidence interval and at 5% absolute precision was used for sample size calculation. Therefore, a sample size of 323 and 384 was considered for the prevalence of fasciolosis and Paramphistomosis respectively in this study.

**Study Methodology**

**Coproscopy:** Faecal samples for this study were collected directly from the rectum of each animal in to clean universal bottle. Each sample was examined using standard sedimentation technique described in [28].

**Statistical Analysis:** All raw data generated were entered into Microsoft excel and analysis was done using SPSS version 16.0. Chi square test was used to determine the variation in infection prevalence between age, sex and body condition. A 5% significant level was used to determine whether there were significant differences between the parameters measured.

**RESULTS**

Out of 384 coprological examinations, the prevalence of bovine fasciolosis was 11.5%. There was a significant difference on the prevalence of fasciolosis between animals of different body condition but no statistically significant difference was observed on the prevalence of fasciolosis among animals of age and sex category in this study (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number sampled</th>
<th>Number affected (%)</th>
<th>χ²-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>374</td>
<td>41(11.0)</td>
<td>3.48</td>
<td>0.062</td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>3(30.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>44(11.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young</td>
<td>178</td>
<td>19(10.7)</td>
<td>0.21</td>
<td>0.654</td>
</tr>
<tr>
<td>Adult</td>
<td>206</td>
<td>25(12.1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>44(11.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Body condition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>339</td>
<td>22(6.5)</td>
<td>70.39</td>
<td>0.0001</td>
</tr>
<tr>
<td>Poor</td>
<td>45</td>
<td>22(48.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>44(11.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Prevalence of Paramphistomosis based on sex, age and body condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number sampled</th>
<th>Number affected (%)</th>
<th>$\chi^2$-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>374</td>
<td>22(5.9)</td>
<td>0.29</td>
<td>0.588</td>
</tr>
<tr>
<td>Male</td>
<td>10</td>
<td>1(10.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>23(6.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Young</td>
<td>178</td>
<td>10(5.6)</td>
<td>0.08</td>
<td>0.775</td>
</tr>
<tr>
<td>Adult</td>
<td>206</td>
<td>13(6.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>23(6.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>339</td>
<td>6(1.8)</td>
<td>91.48</td>
<td>0.0001</td>
</tr>
<tr>
<td>Poor</td>
<td>45</td>
<td>17(37.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>384</td>
<td>23(6.0)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Out of 384 coprological examinations, the prevalence of Paramphistomosis were 6.7%. From 178 young age group examined 10 (5.6%) were positive and out of 339 cattle with good body condition 6 (1.8%) were found affected by Paramphistomum. There was a significant difference on the prevalence of Paramphistomosis between animals of different body condition but no significance difference on the prevalence Paramphistomosis among animals of age and sex category in this study (Table 2).

**DISCUSSION**

Trematode parasitism is one of the major problems lowering ruminant productivity around the world [1]. In Ethiopia, the rich potential from livestock sector has not been efficiently and fully exploited due to several constraints like malnutrition, traditional management practice, poor genetic makeup and prevailing diseases. Among the prevailing diseases in the country, trematodes are reported to be one of the main parasitic problems of cattle and other ruminants [29].

The prevalence and economic importance of fasciolasis has been reported in many parts of the world including Africa. In this study, lower prevalence of bovine fasciolasis (11.5%) was obtained when compared with the prevalence reported by [30] 34% in Zeway region, 61.97% in Gogjam [31], 18.99% and in Nekemte [32]. This gap may be due to asserted that the regional concerned veterinary offices and private veterinary drug shops intervention after the previous studies might have greatly contributed to the minimization of prevalence added up to the reduction of the pasture land. In addition, the prevalence of fasciolasis found in the present study is lower than from the previous report of 30.4% in Hawassa [26] using postmortem examination of animals in the same area in abattoir. This may be due to difference in test methods applied besides change in management system since the previous study. Moreover, most pathological lesions had already occurred before the appearance of eggs in feces [33].

In the present study, the prevalence of male was 30% and female 11%. This result is in agreement with the report of male 19% and female 14% by [34] in Jimma abattoir. This may be due to management, agro-ecological difference and short exposure time of female animals during pregnancy time [35].

The prevalence of fasciolosis age-wise was higher in adult animals (12.1%) than young animals (10.7%). This finding is in agreement with [36] that reported 18.3% in adult and 14% in young in Bahir Dar dairy farm. The prevalence between age groups was not found to be statistically significant. Age has no effect on the prevalence of the fasciolosis. The difference in prevalence may be due to management and long time exposure of adult animals.

Prevalence was also seen on the bases of body condition and 6.5% were recorded in good body condition and 48.9% in poor body condition. The difference was statistically significant (P<0.05). This is in agreement with 11.7% and 22.6% in good body condition and poor body condition, respectively reported by [36]. This result strongly support [37] that stated the dependence of faciolosis on the body condition of animals where Fasciola lead to loss of appetite and poor utilization of food which results in a loss of body weight.

The prevalence of Paramphistomosis in the present study was found to be 6.7%. Based on body condition the prevalence was statistically significant (P<0.05) whereas sex and age prevalence was not found statistically significant. In Jimma abattoir survey, [38] reported prevalence of 45.2% using Coprosopy. Many studies conducted in different parts of the world reported Paramphistomosis prevalence of 22 % in Pakistan [39], 30 % in Kisumu Municipality abattoir in Kenya [40]. In another study, [41] recorded 16.9 % cumulative incidence in Milan, Italy and [39] recorded 17.64 % prevalence in Pakistan. The overall Paramphistomosis in several European countries was fairly high, with greater than 18% in France, Italy and Spain [42]. On the other hand, the prevalence and intensity (warm burden) of parasites recorded in north eastern Algeria at slaughter.
houses had a maximum result 12.1% and 7.3% in Egypt [43]. The result of present data showed slight similarity with that of Egypt. But all the rest reported higher prevalence which may be due to agro ecological factors, management system and post mortem result in abattoir survey [40].

REFERENCES


38. Abebe, F., M. Behabolm and M. Berhanu, 2008. Major trematode infections of cattle slaughtered at Jimma municipality Abattoir and the occurrence of the intermediate host in selected water bodies of the zone.


