

Prevalence of Bovine Fasciolosis in and Around Bedelle District, Ethiopia

Yosef Mamo, Yosef Deneke and Nuraddis Ibrahim

Jimma University College of Agriculture and Veterinary Medicine, Ethiopia

Abstract: A cross sectional study was conducted to determine prevalence and risk factors associated with Fasciolosis in Bedelle district of Oromia regional state from October 2008 to March 2009. Faecal samples from a total of 384 cattle were subjected to coprological investigation. Based on the coprological investigation the overall prevalence of Fasciolosis was 20.8%. The highest (25.27%) and lowest (18.95%) prevalence were recorded in Dikadabana and Bedelle villages, respectively. Statistical analysis showed that no significance ($P>0.05$) difference in prevalence among four villages. The prevalence of Fasciolosis in relation to age, sex and both body condition groups (good and poor) was determined in coproscopy. Statistical analysis revealed that there were no significance difference ($P>0.05$) in prevalence in the previous groups.

Key words: Bedelle • Bovine • Coprology • Ethiopia • Fasciolosis

INTRODUCTION

Fasciolosis is one of the important parasitic diseases in tropical and subtropical countries which limit productivity of ruminants in particular cattle. The disease is caused by digenean trematodes of the genus *Fasciola* commonly referred to as liver flukes. *Fasciola hepatica* and *Fasciola gigantica* are the two liver flukes commonly reported to cause Fasciolosis in ruminants [1].

The economic losses due to Fasciolosis are caused by mortality, morbidity, reduced growth rate, condemnation of liver, increased susceptibility to secondary infections and the expense of control measures [2]. The presence of Fasciolosis due to *Fasciola hepatica* and *Fasciola gigantica* in Ethiopia has long been known and its prevalence and economic significance have been reported by several workers [3- 5]. In Ethiopia, the annual losses due to *ovine* Fasciolosis were estimated to be 48.4 million Ethiopian Birr (1 US\$ =2.07 ETB) per year, of which 46.5, 48.8 and 4.7% were due to mortality, productivity (weight loss and reproductive Wastage) and liver condemnation respectively (6). According to the study conducted by Tadelle and Worku [4] and Fufa *et al.* [3] Fasciolosis caused an average loss of 6300USD and 4000USD per annum at Jimma and Soddo municipal abattoirs, respectively.

Apart from its veterinary and economic importance throughout the world, Fasciolosis has recently been shown to be a re-emerging and widespread zoonosis affecting a number of human populations [7, 8]. Diagnosis is based primarily on clinical sign, seasonal occurrence, previous history of Fasciolosis in the farm or identification of the snails' habitats, post mortem examination and examination of faeces for flukes eggs [2].

In Ethiopia the prevalence of bovine Fasciolosis had ranged from 11.5% to 87% [2]. *F. hepatica* is the most important *Fasciola* species in Ethiopian with distribution over three quarter of country except in the arid north east and east of the country. The distribution of *F. hepatica* was mainly localized in the Western humid Zone of the country that encompasses approximately one fourth of nation [2]. Studies on the epidemiology of Fasciolosis in cattle were not so far conducted in Bedelle district of Oromia regional state. Therefore, the objectives of this study were to determine the prevalence of bovine Fasciolosis in the study area and to assess major risk factors associated with the disease.

MATERIALS AND METHODS

Study Area: The study was conducted from November 2008 to May 2009 in Bedelle Wereda, Oromia Regional State, Illubabor Zone. The area is located in an altitude of

Table 1: Prevalence of bovine Fasciolosis in villages in and around Bedelle district

Villages	No of examined cattle	No of positive	Prevalence (%)
Bedelle	95	18	18.95
Abdella	98	19	19.39
Dikadavana	91	23	25.27
Harokemise	100	20	20
Overall	384	80	20.8
X ² =3.888	df=1	P=0.274	

Table 2: Prevalence of bovine Fasciolosis based on age category

Site	No of examined cattle	No of positive	Prevalence	CI 95%(%)
Young	121	23	19.01	0.899-1.120
Adult	263	57	21.17	0.649-1.505
Over all	384	80	20.8	0.597-1.727
X ² =0.03	df=1	P=0.955		

2060 m.a.s.l. The mean annual rainfall of the area is 1857.7mm and the mean annual minimum and maximum temperatures are 12.4 and 24.6°C, respectively. Natural broad leaf forests and grasslands cover non-cultivated lands in the area. The livestock population of the district is 52197 cattle, 15230 sheep, 11090 goat, 2504 equine species and 38364 poultry and the main farming system in the area is mixed farming.

Study Population: From a total of 52,197 cattle present in and around Bedelle district [10] a sample size of 384 cattle were randomly selected and subjected to qualitative coprological examination. Sex and age groups of local origin were included in this study.

Study Design: A crosssectional survey was conducted selecting four villages randomly from Bedelle district, Oromiya regional state. These include Harokemise, Dikadavana, Abdella and Bedelle villages. The used sampling method was simple random sampling to select the villages and individual cattle in the sites. To determine the sample size, an expected prevalence of 50 % was taken in to consideration since no previous study was conducted in that area. The desire sample size for the study was calculated using the formula given by Thrusfield [11] with 95% confidential interval and 5% absolute precision and it was 384.

Study Methodology: Coproscopy was used to determine positivity of the animals for the disease. Fecal samples were collected directly from rectum of animals. The feces were collected by hands protected by rubber gloves, using two fingers i.e. (middle and index fingers). The samples were taken to the laboratory in tightly closed universal bottles and examined for *Fasciola* species eggs by method described by Antonia *et al.* [12].

Data Analysis: All the data that were collected (age, species and degree of parasitic infection) entered to MS excel sheet and analyzed by using SPSS version 16. Descriptive statistics was used to determine the prevalence of the parasites and Chi-square test (χ^2) was used to look the significant difference between age and species of the host with parasites. In all the analyses, confidence level was held at 95% and $P < 0.05$ were set for significance.

RESULTS

Out of 384 cattle examined for the prevalence of bovine Fasciolosis in and around Bedelle district, 80 (20.8%) cattle were positive for Fasciolosis. The highest prevalence was recorded in Dikadavana village (25.27%) and lowest prevalence was recorded in Bedelle (18.95%). Statistical analysis showed no significance ($P > 0.05$) difference in prevalence between villages (Table 1).

Prevalence of Bovine Fasciolosis Based on Age Category: From 121 young animals examined, 23(19.01%) cattle were positive for Fasciolosis and among the 263 adults examined, 57 (21.17%) of them were positive for Fasciolosis. Statistical analysis revealed that there was no significance difference ($P > 0.05$) in prevalence between age groups (Table2).

Prevalence of Bovine Fasciolosis in Sex Category: From the total of 182 male animals examined, 38 (20.88%) of them were positive for Fasciolosis and from 202 female animals, 42(20.79%) of them were positive for Fasciolosis. Statistical analysis showed no significance ($P > 0.05$) difference in prevalence between the sex groups (Table 3).

Table 3: Prevalence of bovine Fasciolosis based on sex.

Site	No of examined cattle	No of positive	Prevalence	CI 95% (%)
Male	182	38	20.88	0.896-1.101
Female	202	42	20.79	0.694-1.515
Over all	384	80	20.8	0.592-1.587
X ² =0.16	df=1	P=0.900		

Table 4: Prevalence of bovine Fasciolosis based on body condition score

Body condition	No of examined cattle	No of positive	Prevalence	CI 95%(%)
Good	199	44	22.1	0.860-1.055
Poor	185	36	19.46	0.812-1.1791
Over all	384	80	20.8	0.480-1.298
X ² =0.871	df=1	P=0.351		

Prevalence of Bovine Fasciolosis in Body Condition

Basis: The prevalence of Fasciolosis in both body condition groups (good and poor) was determined in coproscopy. Out of the 199 cattle with good body condition, about 44(22.1%) cattle were positive for Fasciolosis and out of the 185 cattle with poor body condition, about 36 (19.46%) cattle were positive for Fasciolosis. Statistical analysis showed no significance (P>0.05) difference in prevalence between the body condition scores (Table 4).

DISCUSSION

The present study was designed to determine prevalence of bovine Fasciolosis. The obtained results, in this study, were indication that Fasciolosis existed in the study area. It revealed 20.8% prevalence of bovine Fasciolosis, based on coprological examination. In the current study the prevalence indicated by faecal examination was in agreement with the report of Wassie [13] who recorded the prevalence of 18.99% at Sodo. While, prevalence of Fasciolosis was not in agreement with the previous reports of Nuraddis *et al.* [14] Fufa *et al.* [3] and Dagne [15] who recorded 12.4%, 4.9% and 80% at Bahirdar, Soddo and Debre Berhan. These differences were probably due to the agro-ecological and climatic differences between the localities, although differences in the management systems might also result in such variation. Urquhart *et al.* [9] also suggested that the difference in prevalence and severity of the disease syndrome were evident in various geographical regions depending on the local climatic conditions, availability of permanent water and system of management.

The prevalence of the disease in different villages of study areas were very closely similar; 18.95% (Bedelle), 19.39% (Abdella), 25.27% (Dikadavana) and

20%(Harokemise) with non-statistical difference (P > 0.05). They were ecologically similar; 2060 m.a.s.l. Yilma and Malone [5] suggested that distribution of fasciolosis had depended on altitude.

The prevalence of the disease in female and male animals was recorded as 20.79 % and 20.88%, respectively. There was non-significant difference (P > 0.05) between the two sexes indicating that sex seemed to be had no effect on the prevalence of the disease. This might be due to the fact that both sex groups were grazing in similar pasture land. Moreover, Fasciolosis was not a disease directly related to animal reproductive system. Similar results have been reported by Graber and Dans [16], Argaw [17]. The present study indicated that there was no significant difference (P > 0.05) between age groups and body condition in the study area. The likely explanation might be that cattle in the study area graze in the same communal grazing land with similar agroecological condition so that the chance of infections therefore similar and early release of young stock with adult.

CONCLUSION

In present study moderate prevalence of bovine Fasciolosis was obtained when compared with prevalence reported by different researchers at different area. In general it could be concluded that Fasciolosis was one of major problem for livestock development in the study area closely linked to the presence of biotypes suitable to the development of snail intermediate host. Strategic anthelmintics treatment with appropriate fluckicide drug should be practiced and a combination of control measures included drainage, fencing and molluscides had to be used to ensure a satisfactory degree of control in the long run.

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