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Intestinal Schistosomiasis of Bovine and Ovine in Fogera District, South Gonder Zone, Amhara National Regional State, Ethiopia

[1]Maritu Merawe, [2]Kassaw Amssalu, [2]Yohannes Hagos and [2]Berihun Afera

[1]Amhara Regional State, Bureau of Agriculture, Mekelle, Ethiopia
[2]Mekelle University, College of Veterinary Medicine, Mekelle, Ethiopia

Abstract: A cross-sectional study was conducted from November 2011-April 2012 in selected four peasant associations of four Fogera District, south Gonder zone to determine the prevalence of bovine and ovine schistosomiasis. Fecal samples from 252 cattle and 152 sheep were collected and coprological examination using sedimentation technique was applied for the recovery of schistosoma eggs. Study parameters such as sex, age, body condition score, species were considered. Overall prevalence of 3.9% was recorded. *Schistosoma* eggs were found to be 5.2 % in cattle and 1.5 % in sheep. Higher prevalence of 9.57% was observed in young animals. However, the difference was not statistically significant ($p>0.05$) between age groups. Similarly there was no statistically significant difference ($p>0.05$) in prevalence of Schistosomosis between male (4.2%) and female (3.6%) animals. On other hand Significant differences ($p<0.05$) between animals with poor and good body condition score was observed where higher prevalence (9.3%) was observed in animals with poor body condition. Even though lower prevalence was recorded, the current study indicates that Schistosomosis is one of the obstacle of livestock production in Fogera district.

Key words: Fogera · Peasant Associations Prevalence · Schistosomiasis · Sedimentation

INTRODUCTION

Schistosomiasis (Bilharziasis or blood fluke) is a parasitic disease of animals and humans. Schistosomosis is an infection caused by a trematode parasite of the genus Schistosoma. Mesenteric and portal vein are important predilection sites for the parasite. Schistosoma is elongated sexually differentiated flukes which live in the circulatory system of their host [1]. *Schistosoma bovis*, *Schistosoma matteei*, *Schistosoma intercalatum*, *Schistosoma spindale*, *Schistosoma indicum* and *Schistosoma nasalis* are the major obstacle of livestock production in Africa and Asia [1, 2].

The pathology and the clinical signs of the disease are largely attributed to the spine egg causing tissue irritation in animals the clinical sign exhibited are emaciation, marked diarrhea mixed with blood or mucus dehydration and marked weight loss [3, 4]. However, Most infection in endemic areas occur at sub clinical infections causes significant losses due to long term effects on animal growth, productivity, increase susceptibility to other parasitic or bacterial diseases.

The disease is endemic in tropical and sub-tropical countries of Asia, Africa and India. According to Islam *et al.* [5], about 530 million heads of cattle live in areas endemic for cattle schistosomiasis in Africa and Asia while at least 165 million cattle are infected with schistosomes. The geographical distribution of schistosomiasis has been determined primarily by the distribution of snail intermediate host [3].

In Ethiopia studies, the different epidemiological study, conducted on animal schistosomiasis illustrates the importance of the disease and the availability of many wetlands that can support the multiplication of snail intermediate hosts and the development of infective cercaria [6-8]. The prevalence of 12.3-33.8% in Bahir Dar has been reported by Hailu [6], Yalelet [8], Solomon [9], Amero [10] and Almaz [11] and 28% in Kemissie by Ameni *et al*. [7]. Mengistu *et al.* [12] have also reported prevalence of 10.17% in the current study area. The epidemiological situation of schistosomiasis must not however, be regarded as static. The increasing production of rice, change in the land use pattern, in the study area may influence the occurrence of Schistosomiasis in the

Corresponding Author: Maritu Merawe, Amhara Regional State, Bureau of Agriculture, Mekelle, Ethiopia.

study area. Therefore, the present study was carried out to investigate the prevalence of schistosomiasis in cattle and sheep in different peasant association.

MATERIALS AND METHODS

Study Design and Sampling Methodology: Across sectional study was conducted from November 2011 to May 2012 to study the prevalence of schistosomias of sheep and cattle in fogera district. Four peasant association namely Gumara, Alember, Quhar michaele and woreta were selected purposively and simple random technique were employed to select the study animals.

Sample Size: The sample size was determined by using technique as recommended by Thursfeild [13] for simple and systematic random sampling methods at 95% confidence interval and at an estimate prevalence rate of 50% and accordingly 384 animals were sampled.

$$N = \frac{1.962 \text{ pexp } (1 - \text{pexp})}{d2}$$

where
N = required sample size
Pexp = the expected prevalence
d = the desired absolute precision

Coprological Examination: Random fresh fecal sample were directly collected from rectum of 384 study animals. All fecal samples were stored in clean universal bottle containing 10% formalin and labeled separately transported to Bahir Dar regional laboratory in an air tight condition. A modified simple sedimentation (Stoll's) technique recommended by Antünia *et al.* [14]. Was used to determine the fecal egg output.

Data Analysis Methods: Data was entered and summarized with Excel 2000 Program descriptive static's such as percentage was used to determine the level of infection a cross different risk factors. The statistical association between risk factors and diseases was evaluated by Pearson's chi- Square (X^2) and differences was regarded statistically significant if p-value is less than 0.05 using SPSS [15].

RESULTS

The current cross sectional study disclosed an overall prevalence (3.9%) of schistosomiasis in the fogera district. The highest prevalence was in Gumara (6.1%) followed by Alember (3.3%) peasant association on the other hand the lowest was in Woreta (1.5%). However the variation was not statistical significant among the four peasant association

It was observed that the prevalence of schistosomiasis was higher in young (9.75%) than adult (2.06%). The variation was statistically significant ($P < 0.05$) (Table 2).

There was no statistically significant variation in prevalence of Schistosomiasis between male and female animals. However the prevalence in males (3.5%) was higher than in female (2.5%) (Table 3).

Table 1: Prevalence of bovine schistosomiasis of ruminants in the study areas

Peasant association	Total examined	Positive	Prevalence
Gumara	99	8	8.08%
Quhare Michael	71	2	2.81%
Woreta	64	1	1.5%
Alember	150	4	2.7%
Total	384	15	3.9%

(x^2= 6.526 and p=0.089).

Table 2: Prevalence of bovine schistosomiasis of ruminants according to age

Age	Total animals examined	Positive	Prevalence
Young	94	9	9.57%
Adult	290	6	2.06%
Total	384	15	3.9%

(x^2 = 10.654 and p=0.001).

Table 3: Prevalence of bovine schistosomiasis on the basis of sex

Sex	Total animals examined	Positive	Prevalence (%)
Male	189	8	4.2
Female	195	7	3.6
Total	384	15	3.9

(x^2=0.106 and P=0.745).

Table 4: prevalence of schistosomiasis on the basis of body condition score

Body condition	Total animal examined	Positive	Prevalence (%)
Poor	151	14	9.3
Medium	233	1	0.4
Total	384	15	3.9

(x^2=19.122 p=0.000)

Table 5: prevalence of bovine schistosomiasis between species

Species	Total animals examined	Positive	Prevalence (%)
Ovine	132	2	1.5
Bovine	252	13	5.2
Total	384	15	3.9

(x^2=3.064 and p=0.080)

Higher prevalence of Schistosomiasis was recorded in animal with poor body condition (9.3%) and the difference was statistically significant (p=0.001).

It was detected that prevalence of schistosomiasis was higher in bovine (5.2%) that in ovine (1.5%). There is no significance difference between species on the prevalence of schistosomiasis.

DISCUSSION

The present study has disclosed an overall prevalence (3.9%) of schistosomiasis in fogera district. This finding is lower than from the previous report in Bahir Dar; 2.3% [10], 10.93% [11], 17.4% [8], 29% [6], 24.73 % [9] and in Kemissie 28% [7] and in fogera 37.5% [16]). The variation could be due to the difference in humidity and availability of swampy area for the production of snail. Moreover the recent expansion of mechanized rice production by draining of the swampy area could also a reason for lower prevalence of schistosomiasis in the current report. On the other hand the present report was higher that the report from Gewanie (1.5%) and Awasa (5.5%) by Lo and Lemma [15]. The difference could be due to irrigation practice, agroecology, husbandry practice (Animal management) and climatic variation of the areas.

The present finding also disclosed higher prevalence in Gumara peasant association than the other peasant association. The variation in the prevalence of the disease may be due to the presence marshy-stagnant, larger boundary border to Gumara River. Urquhart *et al*. [3] has explained the importance of water body and marshy area for the occurrence of schistosomiasis.

In the present study the variation of schstosomiasis between male and female was not statically significant ($p>0.05$), this could be explained by the fact that absence difference in the grazing behavior and grazing place of the two sex. The coprological examination of the current study also indicates that the higher the prevalence of the diseases in young (6.4%) than adult (3.1%) this finding is in agreement with the finding of Almaz [11]. Moreover Variation in body condition score was found statistically significance ($p<0.05$), this is due to the reason that poor body conditioned animals are immune compromised and susceptible to many parasitic or other bacterial disease.

Higher prevalence of schistosomiasis in bovine (5.2%) than in ovine (1.5%) was documented in the current finding. The difference in the prevalence of schistosomiasis in different species of animals could be due to variation in the behavior and feeding system of bovine and ovine. Bovine visit regularly and usually contact snail contaminated marshy area for grazing and drinking than ovine. So a higher tendency for contact with marshy area as a source of contamination could explain the high prevalence of *Schistosoma* in bovine. Ovine usually hate to immerse in water this may reduce their potential for exposure. Generally the current as well as the previous study reveals that schsitosomiasis in highly prevalent diseases of livestock in the Fogera district

In conclusion, the current cross sectional study conducted in the Fogera districts of south Gonder zone of Amahara regional state indicates that lower prevalence of schistosomiasis. However event the level of the disease is enough to impose huge economic lose in the study area. Therefore, further detailed epidemiological studies are needed both on the parasite and its vector, which will be important to investigate a cost effective schistosomiasis control measure in the area. Drainage of marshy area and awareness creation to farmers about the disease should be conducted.

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