European Journal of Biological Sciences 8 (2): 60-63, 2016
ISSN 2079-2085

DOI: 10.5829/idosi.ejbs.2016.8.02.23868

Coporological Prevalence of Ovine Fasciolosis in and Around Debre-Tabor Town, Ethiopia

F.W. Misgia, B. Basaznew and T. Shimels

Department Veterinary Para Clinical Studies, Faculty of Veterinary Medicine,
University of Gondar, P.O. Box: 196, Gondar, Ethiopia

Abstract: A cross-sectional study was conducted from November, 2015 to April, 2016 to determine the prevalence of ovine fasciolosis and identifying its associated risk factors in and around Debre-Tabor town, South Gondar Zone, south eastern Ethiopia. A total of 384 fecal samples were collected from sheep of both sexes and different age groups. The samples were analyzed for the detection of *Fasciola* eggs using sedimentation method. Among the examined fecal samples, 141(36.7%) were positive for *Fasciola* egg. Sex wise prevalence was 37.8% and 35.2% in female and male sheep, respectively and statistically significant association (P>0.05) was not observed between sexes. It was noticed that a higher (41.3%) prevalence rate was recorded in adult age than old (35.3%) and young age (32.7%) and also higher prevalence of local breed (37.3%) than cross breed sheep (33.3%). However, no statistical significant (P>0.05) difference was observed in prevalence between age groups as well as between breeds. The prevalence among the different body conditioned animals was statistically significant (P<0.05) with 69.4 % and 13.4 % in poor body condition and good body condition respectively. All study sites were equally prone to fluke infections. It was concluded that ovine fasciolosis was prevalent, thus posing major economic loss in the study area. Hence, control strategies targeted on the parasite and the intermediate hosts as well as implementation of appropriate grazing management in the study area are warranted.

Key words: Fasciolosis · Ovine · Prevalence · Sedimentation · Debre-Tabor · Ethiopia

INTRODUCTION

Sheep and goat provide as much as 30% of meat and milk consumed in Sub- Saharan Africa and found on smallholding throughout the continents. Sales of sheep and goat and their products are a vital source of cash, especially for small holders who do not have access to credit or farm income. Their small size, high reproductive capacity and rapid growth rate, makes small ruminant a more flexible short term from research and development agencies than have cattle. Most of these animals are kept by small holder farmers and pastoralists and play major role in the economy of the country by providing meat, milk, cash, hide and draft power. In Ethiopia sheep are the dominant livestock providing up to 63% of cash income and 23% of food substance values obtained from the livestock production [1].

Among the many parasite problems of sheep, liver fluke infection is one of the major constraints to sheep production in Ethiopia causing considerable direct and indirect losses. Financial loss due to liver fluke infection was estimated to be 48.8 million Ethiopian birr per year of which 46.5%, 48.8% and 4.7% were due to mortality, reduced productivity (weight loss and reproductive wastage) and liver condemnation. One of the most important factors that influence the occurrence of fasciolosis in an area is availability of suitable snail. Water loge and poorly drained areas with acidic soils in the highlands are often endemic areas for fasciolosis [2].

In Ethiopia, *F. hepatica* and *F.gigantica* infections occur in areas above 1800 m and below 1200 m above sea level, respectively which has been attributed to variations in the climatic and ecological conditions such as rainfall, altitude and temperature and livestock management system. In between these altitude limits, both species coexists where ecology is conductive for both snail hosts and mixed infections prevail [3].

Corresponding Author: B. Basaznew, Department Veterinary Para Clinical Studies, Faculty of Veterinary Medicine, University of Gondar, P.O. Box: 196, Gondar, Ethiopia. E-mail: basaznew2008@yahoo.com.

Ovine fasciolosis is an economically important parasitic disease of sheep caused by trematodes of the liver flukes *F.hepatica* and *F.gigantica* the life cycle of which involves snail intermediate host. Fasciolosis causes substantial economic losses which include death, loss in carcass weight, reduction in milk yield, condemnation of affected livers, decline in production and reproduction performance, predisposing animals to other disease and cost of treatment expenses [4].

A high prevalence of fasciolosis was reported in different parts of the country by different researchers including [5-9]. Despite the significance of this parasite infection, there is no documented report on the occurrence of the parasite in and around Debre-Tabor town. Therefore, the objectives of the present study were to estimate the prevalence of ovine fasciolosis and assess the risk factors associated with the disease in and around Deber-Tabor town.

MATERIALS AND METHODS

Description of the Study Area: The study was conducted from October, 2015 to April, 2016 in Deber-Tabor town, South Gondar zone, south eastern Ethiopia. The study area is situated between 11°51'N and 38°1'E at an altitude of about 2690 m above sea level with an average temperature of 15°C and an average annual rainfall of 1497 mm. Being a highland area, the city is spread on different mountains, slopes and in valleys and has three small rivers. The livestock population in the area comprises of cattle (212,688), goat (51,556), sheep (113,956), horse (7,295) and donkey (22,729). The farming system in the area is mixed type (crop-livestock production) [9].

Study Animals: Indigenous sheep comprising of 327 local and 57 cross breeds, kept under traditional extensive management system, owned by smallholders, were used for the study. The age of animals was determined by dentition [10] and were considered as young (<2 years), adult (2-6 years) and old (> 6 years)[11].

Study Design and Sample Size Determination: A cross-sectional study design was used to determine the prevalence of ovine fasciolosis in the study area. Simple random sampling method was implemented for sampling of sheep. Sample size for the study was calculated using the formula given by [12] with precision level of 5%, confidence interval of 95% and the expected prevalence of 50%, since there was no similar study done previously on the study area. Accordingly, the required sample size was 384.

Sample Collection and Examination: Three hundred eighty-four faecal samples were collected from the rectum of each animal. All samples were kept in clean sampling bottles containing 10% formalin as preservative and identified appropriately. The samples were transported to the laboratory of Debre-Tabor University laboratory for analysis. The samples were later processed in the laboratory using the sedimentation technique. Identification of *Fasciola* eggs was done using a standard microscope under ×10 objective magnification. To differentiate eggs of *Paramphistomum* and *Fasciola*, a drop of 1% methylene blue solution was added to the sediment. Eggs of *Fasciola* species showed yellowish color while eggs of *Paramphistomum* species stain by methylene blue [13].

Data Management and Analysis: Descriptive statistics was used to analyze the sample data. Overall prevalence was calculated by dividing the number of positive animals by the total number of animals examined and times 100. Chi-square ($\div^2$) test was used to asses weather there is a statistical significant difference in gastrointestinal nematode infection between breed, sex, age and management. A statistically significant association between variables was considered to exist if the calculated p-value is less than 0.05 with 95% confidence level.

RESULTS

The result of the fecal analysis showed that off 384 fecal samples examined, 141 (36.7%) were positive for *Fasciola* eggs. *Fasciola* infection was more prevalent in female (37.8%) than male (35.2%) sheep. However, there was no significance difference (p=0.347) in the prevalence of *Fasciola* infection in different sexes. Age wise prevalence was 32.7, 41 and 35.3% in young, adult and old sheep respectively. The difference in prevalence between the three age groups was not statically significant (p=0.594). Likewise, there was no statistically significant differences (p>0.05) between the local and cross breeds of sheep on the prevalence of fasciolosis on fecal examination results (Table 1).

Body condition of sheep was tested as a risk factor for fasciolosis. The body condition results indicate that there was a statistical significant difference between animals having good and poor body condition (P<0.05) where higher prevalence of ovine fasciolosis was observed in poor body condition (69.4%) than good body condition (13.4%) (Table 2).

Based on the study sites, the prevalence was 32.8%, 44.9%, 32.5% and 37.7% in Tsegur-Michael, Selamiko, Eyesus peasant associations (Pas) and Deber-Tabor town, respectively with no statistical significant difference (P>0.05) between sites.

Table 1: Prevalence of fasciolosis in sheep based on sex, age and breed categories.

Risk factor	Category	Sample size	No. of positive	Prevalence (%)	x^2(p-value)
sex	female	222	84	37.8%	0.347
	male	162	57	35.2%	
Age	Young	107	35	32.7%	0.594
	Adult	138	57	41.3%	
	old	139	49	35.3%	
breed	local	327	122	37.3%	0.566
	cross	57	19	33.3%	

Table 2: Prevalence of ovine fasciolosis based on body conditions.

Body condition	Sample size	Positive	Prevalence (%)	x^2(P-value)
good	224	30	13.4%	0.00
poor	160	111	69.4%	
Total	384	141	36.7	

DISCUSSION

In the present study, the overall prevalence of ovine fasciolosis was 36.7%. This finding relatively agreed with the earlier works of [6] (39.5%), [7] (35.94%) and [8] (42.44%) in Ethiopia. This may be attributed to the presence of similar favorable ecological factor for the development of snail intermediate hosts and the parasites. One of the most important factors that influence the occurrence of fasciolosis in an area is availability of suitable snail. Water logged and poorly drained areas with acidic soils in the highlands are often endemic areas for fasciolosis [2].

The current study result was higher than previous report of [14] with a prevalence of 24.2% from Ethiopia. Nonetheless, but lower than the report of [5] who reported a prevalence of 49% in Ethiopia. This discrepancy could be related to the differences in the management system, study method, sample size and control practices in the areas.

The prevalence of fasciolosis in female animal and male was not statistically significant (p>0.05). Similar observations have been made in several studies including [5] in dawa-chafie, kemissie, [6] in Adigrat, North East Ethiopia and [15] in woreda of south Gondar administrative zone bordering Lake Tana. This may indicate that sex of the animals has no impact on the prevalence because both sexes are allowed to graze and are equally exposed to the infection.

Not statistically significant difference (P > 0.05) was recorded among different age groups. In related to our finding, [8, 9, 14] reported higher prevalence in adult sheep than younger animal. In contrast our finding, [6] reported higher prevalence in younger animals possibly indicating that repeated exposure to fluke infestation might have led to the development of certain level immunity in the adult animal as compared to younger ones, consequently impeding the establishment of parasitic infection [16].

The infection rate of ovine fasciolosis on the basis of breed did not show a statistical significant difference (P >0.05). The some results that contract the present finding were reported by [14]. This insignificancy shows that breed has no any impact on the infection rate and both local and cross breed animals are equally susceptible and exposed to the disease.

In the present study, highly statistical significant difference (P<0.05) was observed among various body conditioned sheep where higher prevalence was observed in poor body conditioned animals compared to good body conditioned animals. This agrees with the result of [8, 14, 6]. The probable reason could be due to the fact that animal with poor body condition are usually less resistant and are consequently susceptible to various disease including fasciolosis and may be created by luck of essential nutrients and poor management [17].

The prevalence of the disease in different study sites was not found to be significantly different (P>0.05). Because the study sites were located in the same ecological conditions and suggested that distribution of faciolosis depends on altitude. Differences in prevalence of ovine fasciolosis in different areas may be attributed to variations in ecological, climatic and animal husbandry practices [3].

CONCLUSION

The present study recorded a moderate prevalence of ovine fasciolosis in and around Debre-Tabor Town indicating that fasciolosis is endemic parasitic disease affecting the health and productivity of animal. Strategic use of anthelmintics should be performed to reduce pasture contamination with fluke eggs.

REFFERNCES

1. Menkil, M.J., A. Uggla and P. Waller, 2007. Prevalence and seasonal incidence of nematode parasite and fluke infections of sheep and goats in eastern Ethiopia, tropical animal health and production, 39(7): 521-531.
2. Heinonen, M., G. Pute and S. Kebede, 1995. The of anti-parasitic treatment against fasciolosis on cross breed and Zebu Cows in Ethiopia, World Review of Animal Production, 82: 40-46.
3. Yilma, J.M. and J.B. Malone, 1998. A geographical information system fore cast model for strategic control of fasciolosis in Ethiopia: Vet. Parasitool, 78(2): 103-123.
4. Hillver, G.V., 2005. *Fasciola* Antigens as Vaccines against Fascioliasis and schistosomiasis, Journal of Helminthology, 79.
5. Molalegn, B., I. Nuradis and A. Nahili, 2010. Study on the prevalence of ovine, fasciolosis in and around Dawa Cheffa, Kemissie, Ethiopia. African Journal of Agriculture Reaserch, 5: 2981-2985.
6. Eyerusalem, G., A. Yeshitila and B. Mihreteab, 2012. Prevalence of Ovine Fasciolosis in Adigrat, North East Ethiopia, Global Veterinaria, 9: 92-96.
7. Eyob, H., G. Faye, A. Morka and A. Dabela, 2014. Ovine Fasciolosis Prevalence in Hidebu Abote Woreda, North Shoa, Ethiopia, American-Eurasian Journal of Scientific Research, 9(4): 82-86.
8. Basaznew, B., M. Abeje and C. Mersha, 2012. Pervasiveness of Fasciolosis in Sheep in Yilmana-Densa District, West Gojjam Zone, Amhara Region, Northwestern Ethiopia, Acta Parasitological Globalist, 3(3): 34-37.
9. Tesfaheywet, Z. and K. Negash, 2012. Prevalence of Ovine Fasciolosis in Oda Bultum Woreda, Western Hararghe, Ethiopia.
10. CSA, 2008. Central Statistical Agency, Federal democratic Republic of Ethiopia, central statistical investigation, statistical abstract.
11. De-Lahunta, A. and Habel, 1986. Teeth applied veterinary anatomy, Ewe body condition scoring hand book. W.B, Saunders, campany, 4-6.
12. Thrusfield, M.T., 2005. Veterinary Epidemiology.2 ed. UK. Blackwell Sci., pp: 228-247.
13. Hansen, J. and B. Perry, 1994. The Epidemiology, Diagnosis and Control of Helminth Parasites of Ruminants, A Hand Book, Food and Agricultural Organization of the United Nations, Rome, Italy, pp: 72- 89.
14. Mathewos, T., D. Tadesse and T. Zawdneh, 2014. Prevalence and Associated Risk Factors for Ovine Fasciolosis in Selected Sub-Districts of Alamata District, Ethiopia Global Veterinaria, 13(5): 738-744.
15. Mulualem, E., 1998. Epidemiology of bovine, Fasciolosis in woredas of south Gonder administrative zone bordering Lake Tana, Ethiopian Veterinary Journal, 2: 1-13.
16. Josef, V., C. Johannes, D. Pierre and C. Edwin, 2006. Diagnosis of helminthes infection In Cattle. World buiatrics congress - nice, France, pp: 123-129.
17. Lughano, K. and C. Dominic, 1996. Disease of small ruminants in sub-Saharan Africa, Center for tropical veterinary medicine, VeTAID, pp: 8-21.