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Volume 1 • Issue 3 • 2017

Research Article

Multidisciplinary Advances in Veterinary Science

ISSN: 2573-3435

Prevalence of Small Ruminant Fasciolosis and Its Associated Risk Factors in Haramaya District

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Received: August 23, 2017; **Published:** September 12, 2017

Abstract

A cross-sectional study was conducted to determine the prevalence and risk factors associated with small ruminant fasciolosis in Haramaya Districts from November 2013 to 2014. Fecal samples were examined by using sedimentation technique from 431 small ruminants (291 sheep and 140 goats). The study revealed that the overall prevalence of fasciolosis was 34.8%. The prevalence of fasciolosis based on species were 40.5% and 22.9% in Ovine and Caprine, respectively and a significant difference was observed between sheep and goats. Based on ages and body conditions of the animals there were no significance differences.

The prevalence of fasciolosis based on address varied with highest prevalence recorded in Haramaya (39.3%) followed by Adele (35.34%). Low prevalence was observed in Ifa Bate (26.2%). there was no significance difference ($p < 0.05$) between both address during study. Prevalence of infection based on sex indicated that the prevalence of fasciolosis was higher in female (39.5%) than males (24.6%) and statistically significant difference was found between males and females.

Keywords: *Shoat; Fasciolosis; Trematodes; Haramaya*

Volume 1 Issue 3 September 2017

Introduction

Sheep and goats are common in rainforest areas (Devendra and Meclorey, 1990). In developing countries, including African society shoats can play great role for poor people to get income, due to production of the shoats cannot need such a huge requirements like:- budget to production in farm and also it is easy to keep in small areas for their feeding systems. It gives an offspring within a few months (Getenby, 1991). Shoats are mostly common in rain forest areas which cover 65% and the population of sheep and goats can reaches 25% and 100% respectively found (PACE-Ethiopia, 2003). Their meat production can cover 30% when we compares to large animal (Fletcher and Zelalem, 1991).

Fasciolosis can be affect's and inhibits all ruminants. There are two species of liver fluke, which causes infection on ruminants. These species are: - Fasciola hepatica and F. gigantic. Fasciola hepatica was occurred in worldwide distribution, but mostly it was common in desert or hottest zones. F. gigantic is common in rainforest areas of African and Asian regions. May be, sometime the species of these two fasciolosis can be occurred in the same country as well as in the same areas of agro-ecological region of one country, this is may be due to

availability of good air condition for their development of the intermediate hosts (Mas-Coma., *et al*. 2005). Fasciolosis can causes different effects on animal that inhibit by this conditions, the common effects are: - decrease in milk production, decrease in meat and giving off springs in production systems and also it will not give a good income due to the body of animals that can be affected by these disease was poor and it will causes economic loses for treatment of this condition (Hillery, Apt, 1997).

Fasciolosis has three clinical signs in general, the first sign is: - Acute fasciolosis: - this was occurring due to huge number of metecercariae infested on the hosts. In shoats, this condition of fasciolosis cannot sign clinical signs rather than death of the animals. in some cases it was shows abdominal pain , it will also causes rupture of liver walls and layer and finally it will causes blooding and death will occurs due to hemorrhages and jaundice (Urquhart., *et al.* 1989).

The second sign is , Sub-acute fasciolosis this types of fasciolosis can be occurred due to infestations of medium numbers of metecercariae can affects the hosts and it shows, anemia, jaundice and species can be affected and damage livers and finally causes hemorrhage on affected animals and it was causes totally live damages (Urquhart., *et al.* 1989). The third sign of fasciolosis is chronic fasciolosis and it is common in sheep's. This will happen when the flukes can reaches to reaches hepatic bile duct and it will show different signs this sing are ;- obstruction of bile duct, damage of liver tissue and fibrosis and anemia are the most common signs if this conditions and as well as the condition also causes edema and bottle jaw. Death eventually occurs when anemia becomes severe this type of fasciolosis can also causes as '*black disease*', which is clostridial species of bacterial infections (Radostits., *et al*. 1994).

The diagnosis of fasciolosis is based on primarily on faces examinations. Other diagnostic examinations are immunological, clinical signs, biochemical and hematological examination, season, climatic conditions, and history of the area (Torgerson., *et al*. 1999). The control and prevention method of fasciolosis was based on seasonal treatment and reducing the number of snails populations by chemicals and anthelmentics.

There the objective of this paper was:-

- To estimate the prevalence of small ruminant fasciolosis and its associated risk factors.

Materials and Methods

Study area description

The study was conducted in and around Haramya district located in Oromia regional state, Eastern Hararge Zone. The area has an altitude 1600 to 2100 meters above sea level. The predominant soil types are Rig soil (Haramya series) 60% and heavy black clay soils 40%. Soil texture is sandy loan (District's MoA, 1999). The rainfall of the District is bimodal, the short rain occurring between the months of February to May and the long rain occurring between the months of June to September. The mean annual rain fall is 492 mm ranging from 118-866 mm. The mean maximum and minimum temperatures are 24 and 9 degree Celsius respectively (District MoA, 1999).

Study Design and Study animal

Using cross sectional study, samples were collected from 431 shoats. The study animal was local breeds which were managed under extensive husbandry system. Sheep and goats reared in three districts were randomly sampled to examine prevalence of shoat fasciolosis in the study Based on sex, age groups and body conditions of shoat were considered in the study.

Sampling and Sample size determination

A total of 431 small ruminants (140 Caprine and 291 ovine) were sampled. To calculate the total samples, the following parameter was used, 95% confidence intervals 5% desired level of precision and assumption of 50% expected prevalence of small ruminant fasciolosis. The sample size of both species of animal was determined by using the formula given in Thursfield (2005) accordingly, 431 sheep and goat were used as representative small ruminants on study were done.

$$N = \frac{1.92^2 pexp\ (1\text{-}pexp)}{d^2}$$

Where n = required sample size
Pexp = expected prevalence
d = desired absolute precision

Carpological examination

Fresh fecal sample was collected randomly from selected Sites in and around Haramya districts and it were collected from rectum. Each sample is labeled with the animal species corresponding to date, age, sex, body condition and place. Then the labeled sample was submitted to Haramya University College of Veterinary Medicines, Parasitological laboratories. All fecal samples were examined for the presence of fasciola eggs by using sedimentation techniques and examined under microscopy.

Data analysis

The data was entered (written) and managed in the Microsoft excel database system, SPSS version 20.0 computer programmers was applied for data analysis. The prevalence of shoat fasciolosis was calculated as the number of infected individuals divided by the numbers of individuals sampled x 100. Chi-square (x^2) was used to measure association between prevalence the fasciolosis based on sex, age, and breed, address and body conditions.

Results

The overall prevalence of fasciolosis in this study was 34.8%. From 431 animals examined 150 become positive while the rest 281 animals were negative for fasciolosis. The prevalence of fasciolosis based on species of animals indicated that the prevalence was higher in Ovine than in Caprine, with (40.5% and 22.9%) respectively. Fasciolosis was higher females (39.5%) than males (24.6). animals with good body condition had lower prevalence than those with poor and medium body conditions, and the difference were not significant (p > 0.05).area of origin was not associated 9p.0.05) with prevalence of *fasciola* in both species of the animals.

Species	Sex	Number of examined	Number of infected
Small ruminants	female	293	116 (39.6 %)
	male	138	34 (24.6 %)
Total		431	150 (34.8%)

Table 1: *Prevalence based on sex.*

Chi square = 9.244 significance p = 0.002

Age	Number of examined	Number of affected	Prevalence
Young	132	45	34.1%
Adult	267	92	34.5%
Old	32	13	40.5%
Total	431	150	34.8%

Table 2: *Prevalence of fasciolosis based on age.*

Species	Number of Examined	Number of Affected	Prevalence
Ovine	291	118	40.5%
Caprine	140	32	22.9%
Total	431	150	43.8%

Table 3: *Prevalence of fasciolosis based on animal species.*

Chi square = 13.040 which is significant p = 0.000

Address	Number of Examined	Number of infected	Prevalence
If a bate	107	28	26.2%
Haramya	191	75	39.3%
Adele	133	47	35.3%
Total	431	150	34.8%

Table 4: *Prevalence of fasciolosis based on address.*

Body condition	Number of Examined	Number of affected	Prevalence
Poor	68	28	41.2%
Medium	283	102	36%
Good	80	20	25%
Total	431	150	34.8%

Table 5: *Prevalence of fasciolosis based on body condition.*

Discussion

The overall prevalence 34.8% recorded in this study areas and the result is in line with that reported by (Rubian., *et al*. 2014) who observed 33.3% and also with that of Dinka (1999) who reported 32.9% and 15.9% in sheep and goats, respectively. The result was higher than that of Henok and Mekonne (2011) who reported 11.6% in and around Hirna woredas. This may be due to the difference in humidity and environment of the study areas and the current result is lower than of Zeleke., *et al*. (2012) who reports 62.7% in sheep in bosona worana. This may be due to climatic differences.

The prevalence of fasciolosis was highest in females than in males and there is a significance difference between the two sexes. This result is in line with Rubian., *et al*. (2014) kanyari., *et al*. (2009) and Ahmed., *et al*. (2005) both of them reports higher prevalence in female than males and this was associated with hormonal activities especially at pregnant times the immunity of female animal can be decreased and other reason are due to female can gives milk for long times, this can makes them stress and reduces its immunity and finally leads to susceptible for infections.

The highest prevalence was recorded in ovine (40.5%) while only 22.9% on Caprine and there was a significance difference between the two species in the study areas. This may be due to the fact that Caprine are selective grazers or browsers and their chance of exposure to infective metecercariae not as higher as that of Ovine. This result agrees with finding of Henok and Mekkonnon (2011) who reports 14.6% and 8.8% in sheep and goat respectively, and Dinka (1996) who reported the prevalence of fasciolosis as 32.9% and 15.9% in sheep and goat respectively in and around Asela. Similar finding were previously reported by Sirajudin kedir., *et al.* (2012) who reports fasciolosis in Ovine and Caprine 26.3% and 17.2% respectively.

Based on body conditions the diseases was higher in poor body conditions than in both medium and good body conditions. This may be because infections can lead to a loss of appetite, weakness and emaciation. This result is in line with that of Tesfaheywet and Negash (2012) and Ahmed., *et al.* (2005) who reports highest prevalence in poor body conditions and the infection was not statically significant.

Conclusion and Discusion

Infection with fasciola parasite was found to be common in small ruminants in Haramya and its districts. The prevalence was significantly influenced between animal species and sex in this study. The highest prevalence of fasciolosis recorded in this study clearly indicated that fasciolosis can harbor small ruminants in Haramya districts. Based on our results the prevalence of fasciolosis was highly prevalent in Ovine than in Caprine and based on age the infection was high in old and followed by adult and young and it was also in female than in male.

Therefore based on the above conclusions the following recommendations were forwarded:-

- Control of intermediate host of the infection (snail) by using chemicals.
- Protecting animal from swampy water area and or from stagnant water areas.
- Use of anthelmentics chemotherapy.

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