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Study on the Prevalence of Ovine Lungworm Infection in Minijar Shenkora Woreda, North Shoa, Ethiopia

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Abstract

Across sectional study was conducted from July 2012 to September 2013 in Minjar Shenkora woreda to determine the prevalence of lung worm infection. Feacal sample were collected from a total of 384 sheep and processed with modified baerman technique. From the total of 384 sheep examined an overall prevalence of 15.9% was recorded. The prevalence of *D. filaria, M. capillaris* and P. rufescens were 33(8.6), *6*(4.2) and 12(3%) respectively. There was statistically significant difference ($p<0.05$) among lungworm species. *Dictyocaulus filaria* was the most prevalent in sheep followed by *M.capillaries* and proto strangles are less infected .This study demonstrated that lung worm infection is prevalence in the study area in sheep. Susceptible for the infection species the body condition categories indicated that the existence of significant different and being species of lung worm animal were the most important factors observed to be associated with the occurrence of lung worm infections. Therefore all these necessitate on appropriate control and prevention intervention should be carried out in order to reduce the losses associated with the parasite.

Keywords: Lungworm infection, Minjar Shenkora, Ovine, Prevalence

1.Introduction

In Ethiopia, agricultures are the major source of income. About 55% of the population live in the rural areas are primarily engaged in agriculture and related activities. Thus, agricultures are an important component of the livehood of more than 60% million people in the country (Atesmachew *et al.,* 2006).

Among the predominant livestock species, sheep plays an important role in the socio economic development of African countries. The contents host 205 million sheep of which Ethiopia make in important contribution to the national economy. They supply more than 30% of the domestic meat consumption and generate cash income from export of meat mainly milk, manure for the soil and serve as investment for the farmers. Hence, on increase in sheep production enables to maintain self sufficiency in meat production for the growing number of human population and also increase export earnings (Fletcher and Zelalem, 1991).

However, several factors specially diseases are the main constrain which affect their full utilization. Among these disease the respiratory disease has been identifies as an important problem of sheep in the high land of Ethiopia for the lost two to three decades. In may account for up to 54% of the overall mortality of sheep in central high land of Ethiopia (Muka *et al.*, 2000)

Among the respiratory disease end-parasites such as Dictyocaulidae and /or certain metastronglide are known to exist in East Africa (Ethiopia, Kenya, and Tanzania and South Africa (Alemu, 1999). Endo – parasite including Dictyocaulvs filarial are major cause of death and morbidity in Ethiopia high land (ILCA, 1989). Therefore, the objective of this study was to determine the prevalence of lungworm infection in Minjar Shenkora Woreda.

2.Materials and Methods

2.1. Study area

The study was conducted from July 2012 to September 2013 in Minjar Shenkora woreda. It is found in North Shoa Zone of Amhara Regional State in Central Ethiopia, which is located at a distance of 136 km East of Addis Ababa. The woreda divided in to 25 rural and 2 urban totally 27 kebelles. The altitude range of area is 1040-2380 m.a.s.l. The area receives annual rain fall of 530-730 mm and annual avenge maximum temperature is 260^{o}c. The main crop production Teff 35%, wheat 47%, and other 18%. The agro ecological is Dega 2%, weynadega 45% and kola 52% and the area is suitable for livestock production. There are about 146, 868 cattle, 42,342 sheep and 59,583 goats and 46,393 equine in the district. The main language in the area is Amharic and followsoromic and Argoba (MSWAB, 2004).

2.2. Study animals

A total of 384 local breed of sheep was included in the study at Minjar Shenkora woreda. Both sexes was included in the study. The age was categorized in to two groups as young below six months and as adult above six months by following description of (Aiello and Mays, 1998).

2.3. Study design

Across-sectional study was carried out starting from July 2012 to September 2013 to determine the prevalence of ovine lung worm in the study area.

2.4. Sampling method and sample size

The total number of ovine required for the study was calculated based on the formula given by thrusfield (1995) using random sampling method to calculate the sample size. There is no the previous lung worm prevalence report in the study area. For this case I take 50% of expected prevalence and 5% absolute precision was used and according to the sample size was determined.

$$N= 1.96^2(p)\ (1-P)/d2$$

$$N= \frac{3.84\ (0.5)\ (1-0.5)}{0.05^2}$$

$$N= 384$$

Where

N= Sample size

P= Prevalence

D = desired level of precision (5%)

Therefore, based on the formula the total sample size was 384.

2.5. Sampling methodology

2.5.1. Sample collection

Fecal for parasitological examination collected directly from the rectum of each animal. Using disposable parasitic glob and paced in near screw capped universal (sampling) bottle. Each sample will clearly leveled with the animal identification place of convection, sex, age, body condition, deworming history of the animals and months of sampling of the animal was considered and recorded properly on the prepared format in laboratory fecal examination for the presence of L1 larvae was conducted using modified baerman technique (Urquhart *et al*., 1996).

2.5.2. Modified Berman technique

Baerman technique was a procedure which helps to assess the presence of larvae infectious through warp the faces with in double larvae gauze by completely covered with lack warm water in the beaker for 24 hrs and covert the aliquot in the test tube, avow the larvae to settle at the bottom for 30 minutes and discard the supernatant and examine the sediments for larvae (Urquhart *et al*., 1996).

2.6. Data management analysis

The data was coded and entered to MS excel 2010 spread sheet. The data was analyzed by using SPSS statistical software version 20. Chi- square test was used to see statically significant association between sex, age, body condition and altitudes.

3. Results

A total 384 ovine fecal sample were examined by modified baerman technique the prevalence 384 (15.5%) were found positive out of the total 384 ovine examined 60(26%) was observed in adult animals. While the lower prevalence 1(0.65%) was observed in

young animals (table 1). Generally, the prevalence between the two age group was statistically significant.

Table 1: Total prevalence of lungworm infection based on age

Age	no of examined	Prevalence		
		DF	MC	PR
Young	154	1(0.65%)	-	-
Adult	230	32(13.9%)	16(6.95%)	12(5.2%)
Total	384	33 (8.6%)	16 (4.2%)	12 (3.1%)
P value		0.01	0.12	0.31

Out of the total of 384 ovine examined higher prevalence was observed male animals 32(22.4%) while lower prevalence was observed in female animals 29(12.6%) (Table 2). The prevalence between male and female animals was statically significant.

Table 2: The prevalence of lungworm infection on sex

Sex	no of examined	Prevalence		
		DF	MC	PR
Male	143	22(15.4%)	8(5.6%)	2(1.4%)
Female	241	11(4.7%)	8(3%)	10(4.2%)
Total	384	33 (8.6%)	16 (4.2%)	12 (4.2%)
P value		0.000	0.291	0.12

Out of the total 384 ovine examined the higher prevalence was observed poor body condition animals 25(35.2%) while the lower prevalence 36(18.5%) was observed in medium body condition animals (Table 3).

Table 3: Total prevalence of lungworm infection based on BSC

Body condition	no of animal examined	Prevalence		
		DF	MC	PR
Good	154	-	-	-
Medium	230	21(10.8%)	10(5.2%)	5(2.6%)
Poor	71	12(16.9%)	6(8.5%)	7(9.85)
Total	384	33 (8.6%)	16 (4.2%)	12 (4.2%)
P value		0.04	0.70	0.12

4. Discussion

The present study revealed that over prevalence of 15.5% lungworm infection in ovine. The prevalence of lungworm infection were D.filaria (8.6%), M.capillaris (4.2%) and P.rufescens (3.1%). This result corroborates the reports of Friewengils (1995) in Tigray 15.47%, Sisay (1996) in Bahirdar 11.24% and Tefera (1993) in dessie & Kombolcha 13%. However, the finding was lower than the prevalence of Nethanet (1992) in DebreBrihan 73.25% and Alemu *et al.*, (2006) in N/west Ethiopia 53.6%. The difference in the prevalence of lung worm of sheep in the above studies might be associated with the difference in the method followed for the detection of the larvae of lung worm and or the study area which is not favors for the survival of the larvae of lung worm. The reason for lower prevalence of the disease in this study could be attributed to the establishment of open air clinic, increasing no of private clinic, and increase awareness of farmers to deworm their sheep.

In the present study the level of prevalence was compared between animal of different age groups. Then the studies shows that lower prevalence of infection 1(0.65%) was observes in young animals than the adult one (60(25%). These difference may as a result of immunity variation which helps to expel adult lung worms and the different between the prevalence was statistically significant (P<0.05) which is in agreement with Alemu *et al*., (2006) and Sisay (1996). However this was in contrary with the work of Muluken (2009) in Bahirdar. The other possible reason for higher prevalence in adult animals is may be due to pasture contamination with high degree.

In the current study on attempt was made to see the influence of sex on the overall prevalence of infection. The high level of prevalence was observed in male 32(22.41%) and the lower of the prevalence was observed in female 29(12%). This result was not consistent with Sisay (1996) and Alemu *et al*., (2006). The reason for high prevalence in male could be less management system and the farmers to focus on female animals.

The prevalence rate of lung worm in poor body condition animals was higher 25(35.2%) while the prevalence rate of medium body condition animals was lower 36(18.5%). However, the prevalence rate was statistically significant. This difference due to the felt that poor body condition animals are patented (exposed) to infections and non infectious disease than medium body condition animals. Because of these and other related reasons they were immune suppressed than medium body condition animals. This report disagree with disagree with Mengistome (2006) and Muluken (2009). Their results were a significant difference between poor body condition animals and medium body condition animals.

In the present study three species of huge worm were identified in sheep in coprological examination, however, with different proportional D.filaria and M,capillaries were the most prevalent species identified in sheep while P.rufescens was the least dominant in both species of animals. This finding is in consisted with previous studied (Alemu *et al*., 2010), Regassa *et al*., (2010), where the marked difference in proportion between D.filaria and the other two species (M.capillpris and P.refuscens) is associated with the difference in life cycle of those lung worms D.filaria has direct life and also takes less time to reach the infective stage and after ingestion.

The larvae can appear in the feces in a few weeks (Souls, 1982) compared with D.filaria the transmission of P.rufescens and M.Capilaris is epidemiologically complex event involving the animal host parasites and intermediate host. Furthermore the developing of 1st stage to infective stage larvae in the snail take 2-3weeks and the prevalent period in the final host reaches 5-6weeks. The probability of infection transmission and reinjection would be much lower compared with D.filaria (Urquart*et al*., 1996).

5. References

Aiello, SE and mays, A. (1998): The Merck veterinary mau, val, 8thedMerck and Co. Inc while house station NJ. USA, Pp. 1312- 1333.

Alemu, S (1999): A servay on small ruminant lung worm infection in six districts of wollo. In DVM thesis, FVM, Addis Ababauniversity, Debrezeite, Ethiopia.

Alemu, A., Gelaye, E., Ayelet, G., Zeleke. A. (2006): Study on small ruminant's lung worms in northern Ethiopia vet, parasitol 142, 330-335.

Atesmachew, B. Girma, T. Paisonder, D. yilma, J. (2006): Comparatively assessment of forage and live stock density in tekeze river basin. In Ethiopia veterinary Journal 10(2) Addis Ababa, Ethiopia.Pp 25-36.

Ferether, C.M. (1991): the Merck veterinary manual hand book of diagnosis, therapy and disease percentage and control to the veterinarians,7thed, Merck and Co, inc, USA.

ILCA, (1989): Annual report and program high lands, ILCA, Addis Ababa Ethiopia. Pp 7-10.

Mengistu, G (2006): Preliminary study on prevalence of ovine lung worm infection in Atsbi (Tigray), DVM thesismJimmauniversity, Jimma University.

Minjar Shenkora woreda agricultural rural development basic data (2004): the population of live stock and agro ecological of the study area.

Muka-Samugerwa, E.A. lahlou – kossi, D. minde, JEO. Pages, S, Tembely M:ribbo, L,Baker, R.L, (2000): Between and with in breed variation in lamb survival and risk factor association with cause of mortality indigenous tropical sheep, small ruminant res. Pp. 1-12.

Muluken , Y. (2009): Prevalence of ovine lung worms in and around Bahirdar DVM, thesis college of agricultural and veterinary medicine school of veterinary medicine, Jimma University, Jimma Ethiopia.

Nethanet (1991): Study on the prevalence and control of lung worms ub local Ethiopia high land ship and around Debrebrihan, DVm thesis, Addis Ababa

University faculty of veterinary medicine, Debrezeit, Ethiopia.

Regassa, A., Toyeb, M., Abebe, R.B., Mekibib, B., Mekuria, S., Debela, E., and Abuna, F. (2010): Lung worm infection in small rumianntsprevalncve and associated risk factors in Dessie and Kombolcha districts north east Ethiopia, veterinary parasitology 169; 144-148.

Sisay, (1996). Preliminary study on the prevalence of ovine lung worm infection in and around Bahirdar, DVM trhesis, Addis Ababa University, FVM, Debrezeit, Ethiopia

Souls, E.J.L., (1982): Heliminithes, arthropods and protozoa of domesticate animals, 9th edition, BaillalTinadall. Pp 262-275.

Teferra, S. (1993). Prevalence of ovine lung worms in and around Dessie and Kombolcha

Thrusfield. M. (1995): veterinary epidemiology 2nd ed. Black well science uk,.Pp 182-189.

Urquhart, G. M., Armour, J., Ducan, A.M., and Jennings, F.W. (1996): Veterinary parasitology, 2nded black well science, Scotland pp 39-58.

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