

PREVALENCE AND RISK FACTORS OF GASTROINTESTINAL NEMATODE PARASITES OF SHOAT IN ANDABET DISTRICT, NORTH WEST ETHIOPIA

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ABSTRACT: A cross sectional study on gastrointestinal parasite of small ruminants was conducted from September, 2013 to January, 2014 in Andabet district. The objective this studies to determine the prevalence of infestation in sheep and goats. The overall prevalence of gastrointestinal helminthes parasite infestation in sheep and goat were 72.5%. The prevalence of gastrointestinal helimenth in sheep and goats were 78.4% and 63.3% respectively. Sheep was more commonly affected than goat this showed that statistically significant difference ($P<0.05$) between species. Different prevalence was observed between female (78.0%) and male (71.8%), but there was no statistically significant difference ($\chi^2=0.83$, $P>0.05$). Based on age higher prevalence (82.3%) observed in animals of below 5 years old while the lowest prevalence (66.4%) observed in greater than ten years old and the difference between the prevalence among the different age groups was statistically significant ($\chi^2=6.9$, $P<0.05$). The study shows that gastrointestinal (GIT) parasite was a major problem of small ruminant in the study area. Therefore, comprehensive study on GIT parasite, cost effective strategic treatment and awareness creation to the smallholder should be instituted in the study area.

Keywords: Gastrointestinal, Goat, Risk factor, Prevalence and Sheep

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INTRODUCTION

Sheep and goat are mainly found in arid and semiarid areas of sub-Sahara Africa. They play a vital economics role through provision of meat and milk. They contribute more to household income, manure and skin compared to cattle and camels. Small ruminants contribute a large proportion of readily available meat in the diet of pastoralist. They have been estimated to provide up to 30% of the meat, and 15% milk supply in sub-Sahara Africa where they thrived in wide range of ecological region better than cattle. small ruminants have survive better under drought conditions than cattle due to their low body mass and low metabolic requirement, and maintenance needed in arid and semi-arid areas (Wesongh et al., 2003).

Sheep and goat rearing provides livelihood to millions of people, especially to the poor and downtrodden population in the developing and under developed countries. Parasitic diseases have got unique importance as they cause high morbidity and huge economic losses (ranging from 20 to 25 %) in the form of low wool, meat and milk production, retarded growth, morbidity and mortalities (Gupta, 2006). Among parasitic diseases, helminthes are the major constraint in survival and productivity of these animals. Gastrointestinal (GI) nematodes rank highest on global index with *Haemonchus contortus* on top (Perry et al., 2002).

Small ruminants are widely distributed and are of great importance as a major source of income for small and the landless farmers in rural areas. Helminthiasis, especially parasitic gastro enteritis, pose a serious health threat and a limitation to the productivity of small ruminants due to the associated morbidity, mortality, cost of treatment and control measures (Nwosu et al., 2007). In addition to these threats, infestation with helminthes

lowers the animal's immunity and renders it more susceptible to other pathogenic infections; finally this may result in heavy economic losses (Garedaghi, 2011). The problem is however much more severe in tropical countries due to very favourable environmental conditions for helminthes transmission (Mohanta et al., 2007). The objective of this study was to determine the prevalence and risk factors of Gastrointestinal Nematode Parasites on small ruminant.

MATERIAL AND METHODS

Study areas

The study was conducted in Andabet district since September, 2013 to January, 2014. Andabet is found in south Gondar administrative zone, Amhara regional state, Ethiopia. It is located at 720 km North of Addis Ababa. The minimum and maximum annual rain fall and daily temperature ranges are between 1000 to 1500 mm and 20 to 25 °C, respectively (AWAO, 2012).

Study population and study animals

The study animals were sheep and goat randomly selected from randomly selected three peasant associations (kebeles) The study animals were indigenous breed sheep and goat both sexes (male and female) and all ages groups. A cross-sectional study was conducted on 232 sheep and 150 goats. The study animals were healthy and not treated with anthelmintic during the study period.

Sampling strategy

The sampling method employed to select the study animals was systematic random sampling where a sample of randomly selected sheep and goat. Sample size was determined by taking the expected prevalence of 50% and absolute precision of 5% with 95% confidence level were used and the total sample size was estimated at 384.

Study methodology

Fecal samples were collected directly from the rectum with strict sanitation and placed in air and water tight sample vials. Information about the age, sex, and species was recorded. The age of selected shooat was determined by dentition. A total of 382 fresh faecal samples were collected from the selected sheep and goat flocks. The faecal samples were examined for helminthes eggs using Direct, Sedimentation, Floatation techniques (Foriet, 1999).

Data management and analysis

The data collected from the study area were entered in to Microsoft Excel spread sheet and the data were coded appropriately and analyzed using SPSS version 16 statistical software. Chi-square tests were applied to test the statistical association exists among the risk factor such as species, sex and age with the presence of the infection.

RESULT

A total of 382 fecal samples from small ruminants (232 sheep and 150 goats) were examined. The overall prevalence of gastrointestinal helminthes parasite infestation in sheep and goat was 72.5% (277/382). The prevalence of gastrointestinal helimenth was 78.4% and 63.3 % in sheep and goat respectively. This study showed sheep were more commonly affected than goat this showed that statistically significant difference ($P < 0.05$) between species (Table 1). Different prevalence was observed between female (78.0%) and male (71.8%), but there was no statistically significant difference ($\chi^2 = 0.83$, $P > 0.05$) (Table 2).

Age was also considered as a risk factor and higher prevalence (82.3%) observed in animals of below 5 years old while the lowest prevalence (66.4%) observed in greater than ten years old and the difference between the prevalence among the different age groups was statistically significant ($\chi^2 = 6.9$, $P < 0.05$) (Table 3).

Table 1 - Parasitic infestation in relation to sheep and goats

| Species | No. of animals examined | No. of animals positive | Prevalence (%) | X ² | P-value |
|---------|-------------------------|-------------------------|----------------|----------------|---------|
| Sheep | 150 | 95 | 63.3 | 10.35 | 0.001 |
| Goat | 232 | 182 | 78.4 | | |

X² = Pearson chi-square, (P > 0.05); *P < 0.05; **P < 0.01

Table 2 - Parasitic infestation in relation to sheep and goats by sex

| Sex | No. of animals examined | No. of animals positive | Prevalence (%) | X ² | P-value |
|--------|-------------------------|-------------------------|----------------|----------------|---------|
| Male | 341 | 245 | 71.8 | 0.82 | 0.362 |
| Female | 41 | 32 | 78 | | |

X² = Pearson chi-square, (P > 0.05); *P < 0.05; **P < 0.01

Table 3 - Parasitic infestation in relation to sheep and goats by age group

| Age | No. of animals examined | No. of animals positive | Prevalence (%) | X ² | P-value |
|------------|-------------------------|-------------------------|----------------|----------------|---------|
| <5 years | 79 | 65 | 82.3 | 6.9 | 0.043 |
| 5-10 years | 172 | 125 | 72.7 | | |
| >10 years | 87 | 87 | 66.4 | | |

X² = Pearson chi-square, (P > 0.05); *P < 0.05; **P < 0.01

DISCUSSION

The coprological examination revealed that the overall prevalence of gastrointestinal parasite was 72.5% of which sheep and goat showed 78.5 and 63.7%, respectively. This result lower than the result of Mulugeta et al. (2011) reported 91.32 and 93.29% in and around Bedelle (south western), Bayou (1992) reported 90.23 and 88.13% in Buno province (illubabor), Tesfalem (1989) reported 92.33 and 93.33% in Bale, Gebreyesus (1986) reported 90.41 and 82.13% in Gondar and Genee (1997), Amenu (2005) who reported a prevalence of 97% in sheep in three different agro ecological areas of southern Ethiopia. The overall prevalence of this finding is greater than the overall prevalence of Tesfaheywet (2012) reported 61.4% in sheep and in goats in and around Haramaya. This difference in prevalence could be related with variation like season of study, age and stage of infestation and treatment of animals (Donald and Waller, 1982). Additional factors like sample size, management system (that is, overstocking of the animals, grazing of young and adult animals together with poorly drained land) could also contribute to the different prevalence.

This study showed statistically significant difference (P<0.05) between species. This findings are agree with the report of Samuel et al. (2012) who described that sheep appeared to be more susceptible to helminthes because they predominantly grazed on grass which harbor infective larvae while goat mostly consume browse which is uncontaminated with parasite larvae. Different prevalence was observed between female (78.0%) and male (71.8%), but there was no statistically significant difference ($\chi^2=0.83$, P>0.05). The study findings are similar with the report of Assefa and Sisay (1998), gastrointestinal parasite affects both sexes equally. In similar agro ecological area, there is equal exposure of both sexes to parasite (Armour, 1980).

Age was also considered as a risk factor and higher prevalence (82.3%) observed in animals of below four years old while the lowest prevalence (66.4%) observed in greater than ten years old and the difference between the prevalence among the different age groups was statistically significant ($\chi^2=6.8$, P<0.05). According to Asnaji and Williams (1987), young animals are highly susceptible due to immunological immaturity and unresponsiveness.

CONCLUSION AND RECOMMENDATION

The study shows that gastrointestinal (GIT) parasite was a major problem of small ruminant in the study area. GIT nematode infection was highly prevalent in sheep and young age group. Public awareness creation to shoat owners on proper deworming, sufficient feed supply and minimizing extensive open grazing is important.

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Author's contribution

Gedefaw performed the data collection; laboratory works and writes up of the manuscript. Tadlo revised the manuscript and sending to publishers. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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