Prevalence of Bovine Parafilariasis (Study in and around Arbaya Town)

Samuel Engdaw¹ & Kindalem Bayew²

¹Dr. Samuel Engdaw & ²Dr Kindalem Bayew
¹Animal Health Disease Surveillance Expert in West Belessa Wereda
²Animal Health Department Head in Janamora Wereda
West Belessa, Ethiopia

Abstract: A cross sectional study was conducted from September, 2018 to February, 2019 in and around Arbaya town of West Belessa District to know the prevalence of Parafilaria bovicola infections. During the study period, blood samples from subcutaneous nodules and cutaneous bleedings were collected from 384 animals and processed for laboratory centrifugation and microscopic examinations. Sex, age, animal management system, body coat color, season and origin were taken as risk factors. During the examination, 94 animals were positive with an overall prevalence 24.48%. The prevalence for male and female animals respectively was 25.97% and 21.43%. The prevalence for age was 4.44%, 22.22% and 30.05% respectively for age < 2 years, 2-5 years and age > 5 years. A management system was found 11.11% prevalence for semi intensive and 27.56% for extensive. There was no animal under intensive management in the study area. 19.17%, 26.58%, 22.22% and 28.57% prevalence was observed respectively for coat colored black, red, white and brown animals. The prevalence for season was 13.1% and 29.25% respectively for winter (December to February) and spring (September to November). Animals originated from Arbaya, Asavegari, Amstya, Abaytara and Kalay kebele were recorded with the respective prevalence of 22.39%, 25.56%, 18.64%, 28.57% and 23.81%. Age, Season and Management systems with p-value .001, .003 and .002 respectively are all significantly associated (p<0.05) with the risk of being infected with Parafilaria bovicola. But, sex, body coat color and origin are not significantly associated with the occurrence of the disease with their respective p-values 0.377, 0.332 and 0.687. In conclusion, P. bovicola is one of the nematode parasite that affect cattle production systems. There for, Public awareness creation to owners and disease control and prevention methods should be applied in the area.

Keywords: Cattle, Parafilaria Bovicola, Prevalence, Risk factor & West Belessa.

1. INTRODUCTION

Ethiopia is believed to have the largest livestock population in Africa [1]. The sub-sector is playing a vital role in the economy of the country which contributes about 10% of GDP and provides employment to over 30% of the agricultural labor force [2]. From these livestock population, cattle production is one of the major agricultural industries in Ethiopia. They also play very important roles in food security of the people [3].
There are an estimated numbers of 56.71 million, 14.71 million and 3.22 million cattle respectively in Ethiopia, Amhara region and North Gondar Zone Administration [1]. In this study area, cattles are the major economic resources that the farmers’ economic income mainly depends on the result of farming and dairy products. These animals are managed locally under extensive and semi intensive husbandry systems.

Even though the country has all these cattle resources, full exploitations of these animals are greatly constrained by the parasitic diseases infections [4]. From these parasitic infectious problems, *parafilariasis* is the one that is known to be present in the country [5]. *Parafilaria bovicola* is a vector born parasitic infectious of cattle, which result subcutaneous nodules and bleeding with hemorrhagic exudates of neck, shoulder, trunk, and occasionally udder and teats [6]. The disease *parafilariasis* is also known as “bleeding spots”, “summer bleeding”, “verminous nodules”[7]. The infection finally cause a wide spread economic losses due to death, carcass trimming and hides damage [8]. Therefore this study is designed with the objectives of:

- Determining the prevalence of the disease and its relation with the risk factors.
- To recommend suitable preventive and control strategy.

2. MATERIALS AND METHODS

2.1 Study Area

A cross sectional study was conducted from September, 2018 to February, 2019 in and around Arbaya town of West-Belessa District, Ethiopia. Arbaya is a town in North-West Ethiopia, in Central Gondar Zone Administration. It is found at a distance of 81 km from its zone city Gondar and 178 km far from its regional city Bahirdar. It has a minimum annual average temperature 13 °C and maximum average temperature 35 °C with annual rainfall range from 800 mm to 1200 mm. It is found at 1800-2100 m high above the sea level [9].

2.2 Study Animals

The study was conducted on cattle which were found in and around Arbaya town of West Belesa District. The Study animals were all indigenous cattle breeds with different age, sex, body coat color and different origins which were kept in extensive and semi intensive husbandry systems. The questionnaire show that these cattle under extensive management systems were allowed to graze in the field freely in day light and housed during the night in poorly constructed houses with muddy grounds roofed with either hay or corrugated iron. Strategic de-worming was not practiced by the farmers of the area.

2.3 Study Design

A cross sectional study was conducted randomly in extensively and semi intensively managed indigenous cattle breeds for the determination of the prevalence of *Parafilaria bovicola* infections. Information about age, sex, management system, color and sampling season of the study animals were gathered appropriately. The ages were determined based on owners information obtained and animal’s dentition pattern as described by Johnson [10] and they were grouped into age <2(young), 2-5(adult) and >5(old) [11, 13].

2.4 Sample Size Determination:

The sample size required for this study was determined according to [12]. Since there was no previous work done in this study area, 50% prevalence as an expected prevalence for sample size determination and 95% confidence interval with 5% desired absolute precision were considered. Hence the sample size is estimated as:

\[
N = \frac{1.96^2 \times [P_{exp} \times (1-P_{exp})]}{d^2}
\]
\[
N = \frac{1.96^2 \times (0.5(1-0.5))}{0.5^2}
\]

Using the above formula, 384 animals were required and examined.

2.5 Sample Collection

Blood samples from a cutaneous bleeding point of a suspicious case of shoulder, neck, withers, groin and thoracic area, of randomly selected cattle were collected using a container having 1 ml of 0.85 percent saline solution. These specimens kept cool during the transportation to the laboratory [15].

2.6 Laboratory Examination

The blood collected from the cutaneous bleeding point was transferred to a centrifuge tube and centrifuged at 400 gravities for 10 minutes to deposit free microfilariae or eggs containing microfilariae. The pellet then is examined microscopically for the characteristic eggs containing microfilariae or free microfilariae [14].

2.7 Data Management and Analysis

The collected data were coded and entered into Microsoft Excel spread sheet and Statistical analyses was performed using SPSS version 20 software packages. Descriptive and regression analysis was made to know the Chi-square (\(X^2\)), the significance of the risk factors with the occurrence of the \(P.\)bovicola, and the prevalence described as percentages. Chi-square test at \(P<0.05\) was considered as significant.

3. RESULTS

384 samples were taken from cattle and examined for the presence of the parasite \(Parafilaria bovicola\). From the examined animals, 94 animals were positive with the overall prevalence of 24.48%. Based on table-2 described below, The logistic regression analysis indicated the presence of strong association of \(parafillaria bovicola\) with the risk factors age, season and management systems in the study area with their respective p-values of .001, .003 and .002. This shows age, season and management systems are all significantly associated with the risk of being infected with \(Parafillaria bovicola\) since their p-value, \(P<0.05\). But, sex, body coat color and origin were the risk factors that are not significantly associated with the occurrence of the disease with their respective p-values 0.377, 0.332 and 0.687.

The risk of being infected for young (<2 years) is less likely than adult (2-5 years) and old (>5 years) with their respective prevalence of 4.44%, 22.22% and 30.05%. Cattles are less likely infected in winter (December to February) than spring (September to November) which is the end of the rainy season. The prevalence for season was 13.15% and 29.25% respectively for winter (December to February) and spring (September to November). Cattles which are under semi intensive management systems are also less likely infected than extensive management systems with their respectively prevalence 11.11% and 27.56%. Even though, the disease occurrence was not significant for sex, the prevalence for male and female respectively was 25.97% and 21.43%.

Animals originated from Arbaya, Asawegari, Amstya, Abaytara and Kalay kebele were recorded with the respective prevalence of 22.39%, 25.56%, 18.64%, 28.57% and 23.81%. Even though, body coat color was not found significant, 19.17%, 26.58%, 22.22% and 28.57% prevalence was observed respectively for black, red, white and brown colored animals.
4. DISCUSSION

In this current study, an overall prevalence of 24.48% *Parafilaria bovicola* was obtained. This result (24.48%) agrees with the study of Kiflu *et al.* [13] in Raya Kobo District with the study result 20.42% prevalence. But, this study is relatively lower than the studies in endemic areas of South Africa [14] with the prevalence reported as 36% and 35% in Sweden [15]. This difference may be due to the reasons of agro climatic variation that has its significant value as indicated by the study of Kiflu *et al.* [11], Variation in sampling time as seasonality affects the occurrence of the vector of the parasite, difference in nutritional status and deworming strategy of the area.

The risk factor age with its p-value 0.001 (p<0.05), was significantly associated with the occurrence of *Parafilaria bovicola*. This agrees with the study of Kiflu *et al.* [13] having a significance p-value (p=0.00). Cattle with young age (<2 years) are less likely to be infected followed by adults (2-5 years) and old age (>5 years). This difference may be due to young animals exposure to the vectors is less as they pass more of their time indoor than grazing in the outdoor. This agrees with the concept “parafilarial lesions were not found in cattle from herds managed indoors that has not exposed to face flies” [15].
Seasons with the p-value (0.003) are significantly associated with the disease occurrence and cattle are more likely to be infected during the spring (September to November, which is the end of rainy season) than winter (December to February) with their respective prevalence 29.25% and 13.15% . This agrees with the concept “bovine *parafilariais* in tropical areas mainly occurs after the rainy season” [14]. This study also assured that cattle’s body coat color is not significantly associated (p>0.05) with the occurrence of the disease. This agrees with the study of Kiflu et al. [13] and disagrees with the study of CFADUSAHA [15] as it described more prevalence to light colored animal in relation to easy recognition of bleeding points more easily in light-colored breeds. This study with factor sex having p-value 0.377 (p>0.05) was not significant in relation to parasitic infections and it contradicts with the study of Kiflu et al. [13] that reported as p-value 0.01. This may be due to the difference of the management, work load and feeding system difference of the study area. Cattle management system has been found significantly associated with the disease occurrence with its value .002 (p<0.05). This also agrees with the study of [13] .Those cattle which was being managed semi intensively with the study result 11.11% prevalence was less likely to be infected than extensively managed cattle of 22.22% prevalence. This may be due to cattle under semi intensive management systems has less chance of being exposed to the vector muscid fly that transmit the parasite than extensively managed cattle. This also agrees with the concept “parafilarial lesions were not found in cattle from herds managed indoors and not exposed to face flies” [15] . In this study, samples were taken from different origins around the town and the result show none significance (p>0.05) with the disease occurrence. This may be due to the similarity of the agro climatic zone of the study area.

5. CONCLUSIONS AND RECOMMENDATIONS

This current study show *Parafilaria bovicola* is one of the major parasitic disease problems of cattle in the area. Risk factors such as age, season and management systems were significantly associated with the occurrence. Animals with old ages and under extensive management systems are more affected. The parasitic infections mainly occurred with high prevalence in the spring season. The animals owner has not well informed about the disease characteristics and the Preventive and control methods of the parasite is low practiced in the area. Based on the above conclusions, the following recommendations are forwarded:

- Public awareness creation to owners on sufficient feed supply and minimizing extensive open grazing management systems that expose the animals to vectors are important.
- Farmers should be informed regarding the economic importance and possible control and prevention measures of *P. bovicola*.
- All newly introduced animals into the herd must be quarantined and properly screened and treated.
- Improvement of housing and feeding management is also important.

6. REFERENCE


Zambrut Journal, Link Access;
https://zambrut.com
https://zambrut.com/bovine-parafilariasis/

© Copyright International Journal of Zambrut | Zambrut, Inc.