Prevalence of Equine Fasciolosis in and Around Sebeta, Finifine Especial Zone of Oromiya Regional State, Ethiopia

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Abstract: A cross sectional study was conducted from October 2014 to May 2015 to determine the prevalence of fasciolosis in equine species in and around Sebeta. A total of 384 animals were randomly selected. Fecal samples were collected from these animals for qualitative fecal analysis. These were; 327 donkeys, 47 horses and 10 mules. Of all fecal samples, 29 (7.6%) were positive for fasciolosis. Statistically, there was no significant difference (P>0.05) in the prevalence of fasciolosis among species, sexes and age groups of the three equine species. Significant difference (P<0.05) was observed in prevalence of the disease between animals with different body conditions. The result of this study indicated that fasciolosis is becoming an important health problem seeking strategic prevention and control measures in the study area.

Key words: Equine • Ethiopia • Fasciolosis • Prevalence • Sebeta

INTRODUCTION

More recent estimates have shown that Ethiopia possesses about 9 million equine population [1, 2] Horses, donkeys and mules belong to the group, which has approximately 6.21 million donkeys, which is 32% of Africa’s and 10% of the world’s donkey population and 2 million horses which is 33.5% of Africa population [3, 4]. The large number of equine is found in the central high lands of the country like Sebeta, where about 12, 337 equine populations are found [1] and enjoy diverse topographic and climatic conditions favorable for them. Equines are also important animals to the resource—poor communities in both rural and urban low cost and in the remote areas of the country, park animals offer the only realistic way of obtaining returns from agriculture above mere existence [5, 6]. In the farming system, equines play a vital role in both economic as well as social functions. This is due to the low level of development of the road transport network and the rough terrain of the country [7]. They are kept and often used mainly for tillage, cultivation, threshing, packing and, riding purposes. They are also used for social security, prestige and providing of manure for both energy and soil fertility [8].

Although they are large in number and have great contributions to national economy, certain impediments hinder the maximum utilization of these animals to their potential. Some of these are the abundantly occurring infectious and parasitic diseases and the poor management system to these animals in the country [9]. Parasitic diseases have an economic impact on equines as they cause loss through lowered fertility, reduced work capacity and increased treatment cost [10, 11]; causing pain in affected animals [12] and being a major health hazard, liming the overall performance of-equines [13].

Among the helminthes, strongyles (large and small strongyles), Trichostrongylus axei, Trichodactylylphorus species, Trichonema species, Parascaris equorum, Anoplocephala species, Dictyocaulus arnfieldi and Fasoli species are the most known devastating parasites of equines [14]. Economically, fasciolosis cause an important parasitic disease. Though fasciola species is quite common in many species of mammals, information on its occurrence in equines is scanty [15]. But equines are as suitable as cattle for liver fluke hosts [16]. The two species most commonly implicated, as the etiological agent of fasciolosis with serious economic importance are Fasciola hepatica and Fasciola gigantica. Fasciola hepatica has a worldwide distribution but predominates...
in temperate zones while *Fasciola gigantica* is found in most continents primarily in tropical regions [17, 18]. There is paucity of information in the distribution and predisposing factors of equine fasciolosis in and around Sebeta. Therefore, the main objectives of this study were to determine the prevalence, assess the intensity of the disease and predisposing factors of equine fasciolosis in the study area.

**MATERIALS AND METHODS**

**Study Area:** This study was conducted from October 2014 to May 2015 in and around Sebeta town, which is a capital town of Sebeta Hawas district of Finfine Especial Zone of Oromiya Regional State. This area has a mid sub-tropical weather ‘WeynaDeg’ and highland temperature type climate ‘Dega’. The mean annual temperature and rainfall ranges between 15°C to 21°C and 800 mm to 1199 mm, respectively and it is located 25 km west of Addis Ababa. The altitude of area ranges from 1500-3000 m.a.s.l and the total coverage of the area is 103, 758 km². The major types of soil in the area supporting the crops and the flora of the area are 60% black, 33% red, 5% brown and 2% gray as the agricultural activities are mainly mixed type with cattle rearing and crop production undertaken side by side [19].

**Study Population:** The study animals were equine species; donkeys, horses and mules. All equines were randomly selected by scoring their body condition, sex and age. The age of the animals were determined by dentition and the sampled equines were grouped into two age categories; as young those under two years and adult those above two years old [20]. The body condition of each animals was judged by visual inspection and evaluated as ‘poor’, ‘moderate’ and ‘good’ based on the body condition scoring techniques on Guide of Svendsen [21]. Poor: Emaciated; ribs, spines andtuber coxae are very prominent.Medium: palpable spinous processes; but not prominent, skin and coat are generally in good condition. Good: Spine processes are not easily palpable, well-muscled, shiny coat, intact skin overcoat.

**Study Design:** A cross section study was employed and a simple random sampling technique was followed to select households owned equines and individual animals.

**Sample Size:** The total sample size required for this study was determined based on Thrusfield [22] description using an expected prevalence of 50% since there was no previous study conducted in the area; with 95% confidence interval and 5% precision. Therefore, a total of 384 equines were sampled to determine the prevalence and risk factors of fasciolosis in the area. Among which 327 were donkeys, 47 were horses and 10 were mules.

**Study Methodology:** The fecal specimens were collected directly from the rectum of each animals or from freshly voided feces using disposable plastic gloves and placed in clean screw capped universal bottle and labeled appropriately with animal identification (sex, age, body condition score (BSC), equine species and owner’s name) and kept in icebox and immediately transported to parasitological laboratory of Nationa Animal Health Diagnostic Investigation Center (NAHDIC). In the laboratory, coprological examination was performed to detect the presence of Fasciola Eggs using standard sedimentation technique. To differentiate between eggs of *Paramphistomum* species and *Fasciola* species a drop of methylene blue solution was added to the sediment so that eggs of Fasciola species show yellowish color while eggs of *Paramphitomum* species take stain color of methylene blue [17, 18, 23].

**Data Management and Analysis:** Data collected from the study animals were coded and entered in to a Microsoft Excel sheet data base system used for data management. All statistical analyses were performed using SPSS windows version 20.0 was used for data analysis. Descriptive statistics, percentages and 95% confidence interval were used to summarize the proportion of infected and non infected animals. Statistical significance was set as $P<0.05$.

**RESULTS**

Among 384 animals examined 29 (7.6%) of equines were detected to be positive for fasciolosis. Of this donkeys, horses and mules contributes 26(89.7%), 2(6.9%) and 1(3.4%) respectively (Table 1). There was no statistically significant difference in level of infection among the three equine species ($P < 0.05$). This implies that admittedly, species in equine has no effect on the prevalence of fasciolosis and all species are equally susceptible to the disease.

For the occurrence of fasciolosis in this study sex, age, body condition and intermediate host (snail) were considered as risk factors. The prevalence of equine fasciolosis among different age groups, sexes and body condition scores are indicated in Tables 2-4 below.
Prevalence of fasciolosis among equine species was 7.9% and 7.5% respectively. However, statistically no significant difference (P > 0.05) was observed between age groups (Table 2).

There was also no statistically significant difference (P > 0.05) in prevalence of the disease between sexes. Prevalence of fasciolosis in female and male equines was 7.8% and 7.2%, respectively (Table 3).

Statistically, significant difference was observed (P < 0.05) in prevalence of fasciolosis between equines with different body condition scores (Table 4).

**DISCUSSION**

This study was conducted to determine the prevalence of equine fasciolosis and about 7.6% of the disease was recorded in the study area. This is comparable to other reports in Managasha (9%) by Yilma et al. [24], in South Wollo zone of Amhara Regional State (12.2%) by Seid [25], (12.6%) in Asella and (17.5%) in Bale Goba Yacob and Hagos [26], (17.2%) in Bahar Dar by Bewketu and Endalkalchew [11] and reports (37.9%) in Dodolaby Yacob and Hagos [26], in the central highlands of Ethiopia by Yosef et al. [27] and Mulate [28]. This higher prevalence of the disease in the study area might be due to the presence of conducive ecological factors for multiplication of the intermediate host (snail) and the parasite. The area was swampy and marshy area which is suitable for the intermediate host to continue the life cycle [17]. Hammami and Ayadi [29] have reported that permanent dampness, suitable luminosity basic pH of soil and water and temperature contribute to multiplicity of snails. This study indicated that fasciolosciolos is becoming a quite important health problem which is increasing from time to time. A study conducted by Hardy et al. [30] in Egypt indicated that donkeys are the potential reservoir of fasciolosis and they recommended that donkeys should be considered within the preventive and control measures of fasciolosis.

Prevalence of the disease in this study was not in agreement with the previous reports by Ayele et al. [13] which is 1.5% in Dugda Bora, by Alemayehu and Etaferahu [9] which is 5.9% in South Wollo, by Yacob [2] which is 2.5 in Tiyo, by Getachew et al. [31] which is 5.7%. This might be due to the differences in temperature, moisture, humidity and soil that might favor multiplication of intermediate host, snails and the parasite. The area is water lodged, swampy and marshy area which is suitable for the intermediate host, snails to continue the life cycle [17].

In this study there was no statistically significant difference (P < 0.05) in prevalence of fasciolosis among the three equine species; donkeys (8.0%), horses (4.3%) and mules (10%). This is an agreement with Seid [25] who reported that admittedly, species in equine has no effect on the prevalence of fasciolosis and all species are equally susceptible to the disease.

The prevalence of the disease in female and male animals was reported as 7.8% and 7.2% respectively. There was no significant difference (P > 0.05) between the two sexes indicating that sex seems no effect on the prevalence of the disease. This might be due to the fact that grazing of both sex groups in similar pasture land so that they have equal chance to be infected. Moreover, it might also be that fasciolosis is not a disease directly related to animal reproductive system. Similar results have been reported by Seid [25].

There was also no significant difference in the prevalence of the disease among age groups. This indicates that age has no any significant on the...
prevalence of equine fasciolosis and hence both age groups are equally susceptible to disease. This might be due to the fact that equines young animals graze on the same pasture land together with adult animals. Of course, biologically the pathogenicity of the disease could be severe in young animals as compared to adults.

Prevalence of fasciolosis on the basis of body condition to the study the impact of the disease in emaciated infected animals. The results of the study indicated that the rate of the infection in poor body condition animals was significantly higher (P<0.05) than that of animals with good body condition. This indicates the importance of fasciolosis in causing weight loss and is a characteristics sign of the disease. This is also reported by different authors [17]. Hence body condition is a good indicator of parasitic infection, which can be used by the resource limited communities to identify donkeys with immediate requirement of Anthelmintic, remedies [13].

CONCLUSION

Fasciolosis has been and is still one of the major constraints to live stock development in Ethiopia by inflicting remarkable direct and indirect losses in various parts of the country were suitable biotopes for the development and breeding of snail intermediate host prevail. The prevalence of fasciolosis is higher in the study area as compared to other reports in different parts of the country. Among predisposing factors the presence of conductive environmental condition for development of snail is the major one. Based on the above conclusive remarks, the following recommendations are forwarded: Further epidemiological studies should be conducted on seasonal dynamics of the parasite and its intermediate host; Proper attention should be paid to this parasitic problem and control strategies should be devised at least to reduce the infection rate to economically tolerable level; Strategic anthelmintic treatment should be practices in the area and government and non-governmental organizations should include equines in their priority lists of research and develop integrated disease prevention and control.

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REFERENCES


