Research Article

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Prevalence of Bovine Hydatidosis in Postmortem Examination at Dinkula town of Endegagn Woreda Municipal Abattoir, Ethiopia

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Abstract

A cross sectional study was conducted to determine the prevalence of bovine hydatidosis in cattle slaughtered at Dinkula town of Endegagn Woreda Municipal Abattoir, Gurage Zone, Southern Ethiopia from October 2020 to April 2021. A total of 384 slaughtered cattle were randomly selected and examined for the presence hydatidosis to estimate the prevalence of hydatidosis in the area. The age, sex, origin, and body condition of selected individual cattle was recorded during ante mortem examination and post mortem examination of their lung, liver, heart and kidney. Organs were carefully examined by visualization and palpation of the entire organ followed by one or more incision. Out of 384 examined cattle, 111(28.9%) were found positive for hydatidosis. The prevalence of hydatidosis was significantly (P<0.05) associated with origin and body condition of cattle. However, there was no significant difference (p>0.05) in the prevalence of hydatidosis between different sex and age groups.Therefore, regular Dewormng of the cattle and proper disposal of affected organs and deworming of dogs were recommended.

Keywords: Endegagn, Bovine, Hydatidosis, Prevalence, Abattoir

Introduction

Ethiopia has the largest cattle population in Africa, with around 59.5 million cattle, 30.7million sheep, and about a similar number of goats, 1.2 million camels, and 59.5 million chickens (CSA, 2017). The contribution of livestock industry to the national economy is considerably less than its tremendous potential. Among many constraints that made the livestock sector marginal is due to prevalent of different diseases, malnutrition, and management constraints. Parasitism represents a major obstacle to the development of the sector in the tropics in general (Mage *et al*., 2002) and hydatidosis is among the major parasitic diseases contributing to low productivity of meat production due to carcass or organ condemnation, in particular (Parija, 2004).

Hydatidosis is caused by several species of Echinococ-cus, cestodes parasites in the family Taenidae, genus Echinococcus. E. granulosus, E. multiloculaties, E. vogeli, E. oligarthrus and

possibly E. shiquicus. The two type hyda-tidosis includes unilocular echinococcosis and multilocular echino-coccosis (Tylor et al., 2007). The life cycle of this parasite involves two mammalian -worm in the small intestine and excrete the parasite eggs along with their feces into the environment, while livestock and humans are the main intermediate host (Eckert and Deplazes, 2004).

The outcome of infection in humans and animals is the development of hydatid cysts in lung, liver or other organs. In domestic animals disease due to hydatid cyst is rare, but in human beings it is more dangerous. The significance of domestic animals as host of this parasite is therefore mainly that they act as the reservoir of the infection for man. As the cysts gradually increase in size, they may impair the health status of the host and causes dyspnea when they occur in the lung or digestive disturbance and possible ascites when the liver is affected (WHO/OIE, 2001).

Hydatidosis occurs throughout the world and causes considerable economical and public health problems in many countries. Its distribution is usually more prevalent indeveloping countries, especially in the rural communities where the dog lives in close quarters with man and domestic herbivores (Eckert et al., 2004). As previous cross studies have shown that cystic echinococcosis represented a considerable economic and public health significance in different countries including Ethiopia (Helina et al., 2012). Many researchers have reported hydatidosis in cattle in different parts ot Ethiopia. However, no information is available about its prevalence of bovine hydatidosis in the study area. Therefore, the aim of this study was to determine the prevalence of bovine hydatidosis at the study area.

Materials and Methods

Study Area

A cross sectional study was conducted from Octoberb 2020 to April 2021 at Dinkula town of Endegagn Woreda Municipal Abattoir, Gurage Zone, Southern Ethiopia. The area is located 230 km Southwest of Addis Ababa with a latitude and longitude of 7º45' East and 37º36' West, respectively. The agro ecology of the study area is 70.5% Highland 29.5%, Midl and. The mean minimum and maximum annual temperature ranges from 15ºC to 25ºC, and mean annual rainfall ranges between 1200 and 1400 mm (AGP , 2017).

Study Animal

The study population included all cattle brought for slaughter to dinkula town municipal abattoir during the study period. This population comprised of cattle of different sex, age, body condition and originating from different districts of around Endegagn Woreda(Endegagn, Geto, Enoraner and Amaka) were recorded to estimate the prevalence of hydatidosis.

Study design

A cross-sectional study was carried out from October 2020 to April 2021 on randomly selected cattle to investigate the prevalence of hydatidosis in bovine slaughtered at Dinkula municipal abattoir and postmortem inspection of lung, liver, heart and kiidney was carried out. During the study period special attention was given to the lung, liver, heart and kidney of each slaughtered animal and carefully examined by visualization and palpation followed by incision of the organ to confirm the problem (Jenny, 2009).

Sample Size Determination

The sample size was determined by taking 50% expected prevalence since there is no recorded prevalence of bovine hydatidosis in Endegagn Woreda municipal abattoir. Confidence interval of 95% and 5% desired absolute precision was taken. The sample size of study was determined by using the formula given by Thrustfied (2005).

$$N = \frac{1.96^2 X\ pexp(1-pexp)}{d^2}$$

Where; N=require sample size, 1.96 = the value of z at 95% confidence interval d= desired absolute precision (5%), pexp=Expected prevalence (50%) accordingly, a total of 384 cattle

Ante Mortem Examination

Data collect was include age, sex, body condition score (BCS), origin of animals. Study animals was categorized in to two age groups as young (<6 years) and adults (> 6years) based on their dentition (Johnson, 2007). In addition, animals was also classified in to three groups based on their body condition score (BCS) as poor, medium, good and sex as female and male.

Post Mortem Examination

Post mortem examination was carried out on different organs of each of slaughtered animals, particularly lungs, liver, heart, and kideny. Each organ was assessed macroscopically either by visual inspection or palpation and where

necessary one or more incision were made to detect small hydatid cysts (FAO, 2003).

Data Analysis

Data of the current study was entered into Microsoft Excel spread sheet to create a data base and analyzed using SPSS software version 20. Descriptive statistics was used to determine the prevalence of the parasite and Chi-square (2) test was used to assess the association of the prevalence of fasciolosis and its associated risk factors such as sex, age, origin, and body condition score of the animals.

Results

From the total cattle (384 cattle), a total 332 male and 52 female animals were examined for hydatidosis prevalence and a prevalence of 29.5% and 25% were obtained in male and female animals respectively. The result indicated that there was no a significant difference (P> 0.05) in the prevalence of hydatidosis between different sex group shown in the Table1 below.

Table1: Prevalence of of bovine hydatidosis based on sex.

Sex	no of cattle examined	Positive	Prvalence(%)	x^2	P-value
Female	52	13	25	.446	.392
Male	332	98	29.5		
Total	384	111	28.9		

A total of 324 adult and 60 young cattle were examined for the prevalence of hydatidosis. Hydatidosis detected in all age groups and a higher prevalence of hadatidosis was recorded in young cattle and the prevalence of these age

groups was found to be 27.7% for adult and 35% for young. However, there was nosignificant difference (p>0.05) in the prevalence of bovine hydatidosis between the different age groups shown below in the Table2.

Table2. Prevalence of bovine Fasciolosis based on age

Age	no of cattle examined	Positive	Prvalence(%)	x^2	P-value
Adult	324	90	27.7	1.285	.173
Young	60	21	35		
Total	384	111	28.9		

The prevalence of hydatid cyst from examined animals of different origin was Endegagn (32.2%),Geto (24.1%), Enoraner (23.3%), and Amaka(36.4%). High prevalence of bovine hydatidosis was obtained from animals of Geto origin. There was significant difference (P<0.05) in bovine hydatidosis between animals of different origin shown in the Table4 below.

Table 4: Prevalence of Bovine hydatidosis on origin basis.

Origin	no of cattle examined	Positive	Prevalence(%)	x^2	P-value
Endegagn	202	65	32.2	3.732	.001
Geta	87	21	24.1		
Enoraner	73	17	23.3		
Amaka	22	8	36.4		
Total	384	111	28.9		

From 384 examined cattle, 226 good, 113 medium and 45 poor body condition animals were examined and the prevalence was 25.6%, 29.2%,and 44.4% respectively. The result of the study showed that there was a significant difference(P<0.05) in the prevalence of bovine hydatidosis in different body condition score shown in the Table 5 below.

Table 5: Prevalence of bovine fasciolosis on body condition basis

Body condition	no ot cattle examined	Positive	Prevalence(%)	x^2	P-value
Good	226	58	25.6	7.167	.003
Medium	113	33	29.2		
Poor	45	20	44.4		
Total	384	111	28.9		

Discussion

The current revealed that the prevalence of bovine hydatidosis during the study period was (28.9%). This result was lower than the report of Dechassa et al. (2012) and Nigatu et al., 2009) who reported prevalence of hydatidosis 40.5% at Addis Ababa Abattoirs Enterprise and 34.05% in Bahir Dar Municipal Abattoir, Ethiopia. However, it is higher than the results of Kebede et al., (2009) who reported prevalence of 22% hydatidosis in Tigray region. This variation may be due to the ecological and climatic condition such as altitude, control and deworming of their intermediate and final host.

The current study revealed that there was no a significant difference in the prevalence of hydatidosis in animals of different sex group. The result of the current study was not in line with several previous studies in different parts of the countries (Tuge, 2020). This could be associated with similar management given to both male and females cattle. However, in the study, the number of male cattle examined was higher than that of female cattle. These female cattle may not have been adequately represented in the study. The finding of the current study indicated that age has no significant effect on the prevalence of bovine hydatidosis. The current finding was consistent with the result of Ermias (2019) who reported that age has no significant effect on the prevalence of bovine hydatidosis. The current study showed that the the prevalence hydatidosis in young examined cattle was higher than that of adult cattle. This may be due to low attention of deworming strategy is given to young age.

The result of current study indicated that the origin of the cattle has significant effect on the

prevalence of bovine hydatidosis.. The highest prevalence of fasciolosis was found in Amaka(36.4%) followed by Endegagn(32.2%). The current finding was consistent with the findings of Morar et al., (2003) but not consistent with the finding of Mukeria et al., 2019. This might be due to difference in culture, social activity, animal husbandry systems, lack of proper removal of condemned organs/carcass and control measures and attitude to dogs(Mulatu et al., 2013). The prevalence of hydatidosis was found to be 44.4%, 29.2% and 25.6% in poor, medium and good body conditioned animals, respectively.

The result of the current study revealed that hydatidosis in poor body condition cattle were significantly higher (p<0.05) than that of medium and good body conditioned cattle. This implies that the body condition of the animal has significant association with the occurrence of hydatidosis. The prevalence of hydatidosis was higher in the cattle. the high prevalence of hydatidosis in poor body condition cattle could be justified by the fact given by Devendra and Marca (1983) who indicated that cattle of poor body condition are vulnerable to parasitic diseases.

Conclusion and Recommendations

The result of the present investigation showed that hydatidosis at Dinkula town of Endegagn Woreda Municipal Abattoir indicates that hydatidosis significantly prevalent parasitic disease affecting the health and productivity of the cattles and result economic losses due to condemnation of the organs. The current findings indicate the presence of significant infection is due to lack of awareness about deworming and controlling of intermediate and final host. Therefore, it is necessary to establish appropriate strategy for prevention and controls of the disease and the following recommendations are forwarded:-

➢ Awareness creating programs should be given for husbandary, butchers and dog owners as to the dangers of hydatidosis to animal and human health.
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➢ Proper control measure should be taken to stop the sale of contaminated meat for pet animal's consumptions.
➢ Waste disposal system should be applied, particularly around slaughter houses and abattoirs.
➢ Dogs should not provide raw offal is an effective measure. Control of stray dogs should be practiced.
➢ The government should supervise slaughtering practices in order to prevent the illegal slaughtering of animals.
➢ There should be regular deworming of dogs for hydatid infections.

Acknowledgements

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