IJABR Vol. 14(2): 135- 143 (2023)

Review article

PREVALENCE OF FASCIOLIASIS INFECTED CATTLE SLAUGHTERED IN GOMBE CENTRAL ABATTOIR

***[1,2]Sulle, M. O., [1]Samaila., A. B[1]Wana, M. N., and[1]Panda, S. M.**

[1]Department of Biological Sciences, Faculty of Science, AbubakarTafawaBalewa University Bauchi, Nigeria.
[2]Department of Biological Sciences, Faculty of Science, Confluence University of Science and Technology Osara, Kogi State.

Submitted: November, 2023; Accepted: December, 2023; Published: December, 2023

ABSTRACT

Bovine fasciolosis is a zoonotic parasitic disease of cattle caused by trematodes usually *Fasciola gigantica* and *Fasciola. hepatica* in the tropics. The disease is found in vast water lodged and marshy grazing field, condition anticipated to be ideal for the propagation and maintenance of high prevalence of fasciolosis. This disease is widely distributed in areas where cattle are raised and there is a niche for Lymnaeid snail. A study to determine the prevalence of fascioliasis in cattle slaughtered at the Gombe central abattoir was carried out from October 2022 - April 2023. One Thousand faecal sample of four breeds of cattle between the age of 1-6yrs slaughtered at the abattoir were examined forfascioliasis at postmortem. The four breeds of cattle were, White Fulani (955), Red Bororo (19), Sokoto Gudali (8) and Muturu (18). An overall prevalence of 369 (36.9%) was recorded. The white Fulani breed was the most infected, with a prevalence of 357 (37.4%), Red Bororo 6 (31.6%), Sokoto Gudali 1 (12.5%) and Muturu 5 (27.8%). Infection by age and sex revealed that adults had a higher prevalence of 221 (40.8%), young cattle 148 (32.3%). while males had a prevalence of 174 (31.93%) and females 195 (42.80%). These differences were statistically significant. The study concludes that fascioliasis is prevalent in cattle in Gombe central abattoir and could be of economic and public health significance.

Keywords: Prevalence, Fascioliasis,Cattle, Gombe State.

Corresponding author's email: sulemary686@gmail.com, Tel: +234 8036532235

INTRODUCTION

One of the most important parasitic liver diseases in ruminants is considered to be Fascioliasis which is sometimes called liver fluke disease, or liver rot [3,5,6,25,21]. The disease affects farm livestock mostly cattle and sheep and the two important species of *Fasciola* parasite that are commonly considered as the causative agents of fasciolosis are Fasciola. *hepatia* and Fasciola. *Gigantica* [9,10,22,24]

The distribution of fasciolosis is affected by certain important multiple factors that usually overlap [28,27,32,37]. Studies have shown that fasciolosis infections are more prevalent during the seasons of rains as compared to relatively drier seasons hence peak liver condemnations period. [17,29,30]. Some studies have also reported fasciolosis occurring throughout the year, [14,26,8,34]. The snail habitat may be permanent or temporary [31,33,35]

Prevalence with Relation to Age, Breed and Sex

Prevalence studies have shown that the risk factors associated with fasciolosis including age, breed, sex of livestock have great significance on the prevalence of fasciolosis. Age of an animal is an important determinant of *F. hepatica* infection. The prevalence generally tends to increase with age. Studies on the sex showed higher prevalence in female cattle than in male cattle [2,4,15]. Breed is a potential determinant of fasciolosis. It has been reported that foreign breeds have higher prevalence than the local breeds. However, other studies have found that traditional breeds show higher prevalence than exotic cattle [7,16,18].

Published information on the prevalence of fascioliasis in cattle in Gombe is scarce, considering the fact that Gombe is predominantly cattle rearing area. However, field veterinarians continue to observe the disease at post mortem examination. This study was therefore designed with the view of providing baseline information on the prevalence of fascioliasis in cattle slaughtered at the Gombe abattoir, Nigeria. The baseline information provided will be useful for planning control measures and programs against the disease in the area.

MATERIALS AND METHODS

Study Area

The study was conducted at Gombe metropolis. Gombe State is located in North - Eastern Nigeria between Latitudes, 10.3638 ˚N and 11.1928 ˚E, with a current metro area population of 551,000 at latitude 10°08 N and 11° 241 E and longitude 11° 021 N and 11°181E. It shares common boundary with Akko Local Government Area in the Southern and Western parts of the State; Yamaltu-Deba to the Eastern and Kwami to the Northern part of the State. It occupies an area of about 45km2 (Gombe Master Plan, 2003). The study was conducted at Gombe central Abattoir, in the capital of Gombe State. All the samples were gotten from all the cattle presented for slaughter at the abattoir for the period of seven months.

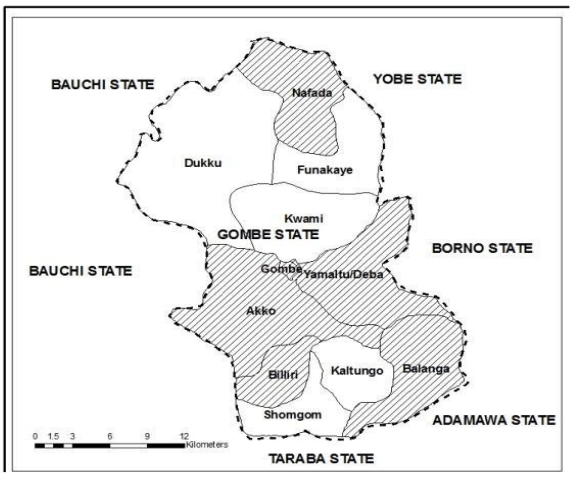

Fig 1: Map of Gombe State
Source: GIS Unit, Geography Department, Gombe State University, Gombe.

Sampling procedure and post mortem examination of faecal samples for fascioliasis

One Thousand (1000) cattle were examined, which comprised of 955 White Fulani, 8 Sokoto Gudali, 19Red Bororo and 18 Muturu breeds. Visits were made to the abattoir three times in a week for a period of seven months (October 2022- April 2023). On each visit the number of cattle slaughtered, the breed, sex and age were noted. The animals slaughtered in the abattoir were bought from the Tashan Dukku and Pantami cattle markets in Gombe, and from neighboring States like Borno, Yobe, Adamawa, Bauchi, Taraba and Kano States.

Determination of Age, Sex and Breed of Cattle Sampled.

Sex determination

The sex was determined by observing the genitals or sex organs. Male cattle (bulls) have a penis, while female cattle (cows) have a vagina [13].

Age determination

The age was determined using dentition according to [11].

Breed determination

The information on breeds were obtained according to[12].

Collection of Faecal Sample for Prevalence of Fascioliasis.

2 grams of faeces was collected directly from the rectum of slaughtered cattle using a sterilized hand glove into a well labeled universal sample bottles. These was preserved in an ice pack in cold box and then transported to parasitology laboratory at Abubakar Tafawa Balewa University Bauchi, Bauchi State for analysis.

Data Analyses

Chi square test was used to check for possible association between the prevalence and the various variables. Statistical Package for Social Science [36]. The Prevalence rates were calculated by multiplying the ratio of number of cattle infected with fasciolosis and total number of cattle examined by 100.This was done for variables such as age, breed, sex. The Chi square test, Odds ratio were employed to check for statistical association between the prevalence rates and values of $p < 0.05$ were considered significant, Descriptive statistical analysis was done to measure the mean, SEM, 95% confidence interval (CI)

RESULTS

Breed, Age and Sex specific prevalence

During the study period, a total of 1,000 faecal samples were collected from cattle presented for slaughter at the abattoir, and of the sampled cattle 369 tested positive, this implies that 36.9% of the slaughtered cattle had *fasciola* eggs in their faeces, bile and some had adult worms in their liver. It was observed that there was prevalence of *fasciola* in the cattle slaughtered at the study from the data obtained and this was related to the availability of the risk factors found to be the factors that predisposes the animals to fascioliasis. Out of the 1000 cattle examined, 369 (36.9%) were infected with fascioliasis. These comprised of 357(37.4%) White Fulani, 6(31.6%) Red Bororo,
1(12.5%) Sokoto Gudali and 5 (27.8%)

Muturu breeds

The White Fulani breed was more infected by fascioliasis, followed by the Red Bororo, the Sokoto Gudali and the Muturu breeds. The difference in the prevalence of fascioliasis in the different breeds of cattle examined was insignificant ($P > 0.05$). Female cattle had higher infection with fascioliasis 195(42.86%) than males 174 (31.93%), this was also statistically not significant. The prevalence of fascioliasis in cattle between the ages of 4 - 6 years varied significantly at 40.8% (P=0.053, 95% CI=11.905) while below 4years 32.3% (P=0.032 at 95% CI = 5.055) also varied significantly

Table 1: Prevalence of Fascioliasis according to Age,Breed and Sex in the Study

Variable	Number of Cattle Examined (n=1000)	Number of Cattle Positive (n=369) (36.9%)	P-value	Odd ratio (95% CI)
Age (Yrs)				
1-3	458	148 (32.3)	0.032	5.055
4-6	542	221 (40.8)	0.053	11.905
Breed				
SokotoGudali	8	1 (12.5)	0.246	2.455
Red Bororo	19	6 (31.6)	0.395	1.400
Muturu Brown	18	5 (27.8)	0.488	1.038
White Fulani	955	357 (37.4)	0.491	1.028
Sex				
Female	455	195(42.86)	0.242	0.13
Male	545	174(31.93)	0.303	0.199

KEY: SG= SokotoGudali; MB= Muturu Brown;RB=Red Bororo; WF= White Fulani Source: Gombe Central Abattoir 2022/2023

DISCUSSION

The results of this study revealed an overall prevalence of 36.9%, which suggest that fasciolosis may be prevalent in the study area. The reason for this could be due to increase in irrigated land masses in the study area and tendency for animal keepers and farmers to allow the animals graze on these marshy and damp areas. Since intermediate host prefers swampy area with slowly moving water and small streams which also allow sufficient moisture for the survival of the infective metacercariae, this could also be another reason for the prevalence of this parasite in the study area.
The result of this study is in close agreement with the finding of [1], in Gombe who reported from their work at Gombe abattoir that of the 320 cattle examined 83 (25.9%) were infected with fascioliasis. This comprised of 56 (36.1%) White Fulani, 20 (21.7%) Red Bororo, 7 (13.2%) Sokoto Gudali and 0(0.0%) Muturu breeds. This work is also in conformity with the work of [20] in Bauchi abattoir who reported prevalence of fascioliasis in cattle to be 45.7% Similarly, in Maiduguri who reported 15.3% which is much lower than the value obtained in the present study, this value is lower than the value obtained in the present study [19]. The value obtained from the present study however appeared to be low when compared with the value obtained by [38] at 32.29% in Minna, Niger State. The differences among the geographical locations could be attributed mainly due to the variation in the climatic and ecological conditions such as altitude, rainfall and temperature.

Prevalence of Fascioliasis

The prevalence of Fasciolosis among both sexes differs insignificantly in males (31.93%) and in females (42.86%). This value shows that Fasciolosis is not actually a sex specific disease; rather it occurs due to exposure of the animals to the contaminated pasture.
The work in the Present study disagrees with the work of [23] that worked on prevalence of fasciolosis in cattle slaughtered at Sokoto metropolitan abattoir, who reported higher prevalence in males 27 (28.42%) than female 35(27.13%). The prevalence of Fasciolosis in young cattle was found to be lower (32.3%) than adult ones (40.8%). Differences in sex, age and breed specific prevalence were statistically significant, thus sex, age and breed could be risk factors, this could also be another reason for the prevalence of this parasite in the study area.

Declarations

Authors Contribution

SMO conceived the idea about the project and designed the study. SMO, SAB, PSM and WMN participated in the data collection and samples from the study areas. SMO performed the data analysis. SAB, PSM and SMO interpreted the data and prepared the first draft of the manuscript, reviewed by WMN. All authors contributed to the development of the final manuscript and approved its submission.

Disclosure of Conflict of Interest

None

Ethics Approval and Informed Consent

Ethical approval for this study was obtained from the ethical review board of the Gombe State Ministry of Health with reference number GSG/MOH/ADM/621/VOL.1/320. All participants were duly informed of the subject of the study and the protocol for sample collection. All participants signed an informed consent form were signed. Participation was voluntary.

Disclosure of Funding

The study did not receive any external funding.

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