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Full Length Research Paper

Prevalence of fascioliasis among animals slaughtered at Sokoto state Abattoir

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A preliminary study on the prevalence of fascioliasis among animals slaughter at Sokoto State Abattoir was conducted to know the status of disease in area.A total of 250 animals were investigated consisting of 82 cattle,90 sheep and 78 goat. The liver of each animal was examined for adult and larvae of *Fasciola*species making several incisors and as well as bilesamples were collected and processed using formal ether concentration technique and microscopically examined for presence of *Fasciola* eggs. The result showed that 74 (29.6%) of the animals were infected with *Fasciola hepatica*. The animals group distribution of the infection showed that the sheep had the highest prevalence of 34.4 %, followed by the cattle with 29.27%, and goatwith 24.36% infection rate. There was a sex dependent difference in infection among the animals examined (chi-square, p<0.005). Control measures such as reduction of worms burden through chemotherapy and eradication or reduction of snail intermediate host population will help reduce high rate of infection with *F.hepatica* of animals in Sokoto State.Regular treatment of all infected animals with an effective medicine, as well as snail habitat control, public enlightenment about the disease and proper abattoir inspection from time to time were suggested.

Keywords: Cattle, Fascioliasis, *Fasciola hepatica, Fasciolagigantica,* Freshwater snails, Liver flukes, Ruminant animals, Sokoto, Trematodes, Tropical diseases .

INTRODUCTION

Fascioliasis is a parasitic disease caused by a digenetic trematodes belonging to the family fasciolidae.Fascioliasis is known globally to be an important helminthic diseases of ruminants caused by liver fluke species of the genus *Fasciola*and it is one of the most neglected tropical zoonotic diseases *(*World Health Organization, 2009*)*.It is a serious infectious parasitic disease infecting domestic ruminants and humans, tops all the zoonotic helminthesworldwide (Haridy*et al*., 2002).

It has the widest geographic spread of any emerging zoonotic disease and it occurs in many countries of the world (Mas-Coma *et al.,* 2009). *Fasciola hepatica*, which is a common among species of cattle and sheep was the cause of the most reported cases of fascioliasis worldwide. The diseases is common in livestock as compared to humans but infection among people had been reported to be more than 2 million (CDC, 2015).

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The disease is usually characterized by a chronic, sometimes acute or sub-acute inflammation of the liver and bile ducts, accompanied by submandibular oedema, anaemia, anorexia, general intoxication, and death (Ogunrinade and Ogunrinade, 1980).

Epidemiological studies in animals and humans in different regions worldwide have shown that around 91 million people are at risk of fascioliasis infection with 17 million people being already infected *(*Mekky *et al.,*2015*).* The disease is classified as a neglected tropical disease (NTD).

The main two liver flukes species causing fascioliasis are; *Fasciola hepatica* and *Fasciolagigantica*. These flukes are hermaphrodites and they live mainly in the bile duct and gall bladder of infected animals. The two species have a common life cycle and are associated with severe damage to the body organs. These effects are sometimes so severe that they lead to death of the affected livestock *(*Mahami-Oskouei *et al.,* 2012*).*

The economic losses due to this disease in most parts of Sub-Saharan Africa is difficult to quantify because most of the livestock farmers are nomadic pastoralists who constantly shift from one area to another according to the

prevailing climatic conditions and in search of water and grazing fields making the control of this diseases difficult. This infection is important and of great concern to livestock farmers because of the mortality of livestock, high cost of management, and reduction in milk and meat production associated with it *(*Olsen *et al.,* 2015*)* The incidence of fascioliasis in developing countries is sometimes as high as 77%. Fascioliasis is regarded as the most important helminthic zoonotic infection of bovines in tropical countries with a prevalence ranging from 30 to 90 percent being reported *(*Ashrafi *et al.,* 2014*).* The high consumption of meat globally has led to concerns about its hygiene and safety as a result of high fascioliasis infection rate(Odigie and Odigie, 201*3*).

There is a lot of existing literature on fasciolosis infection in tropical regions with corresponding presence of *Lymneaspp*, the snail species responsible for its transmission.

Due to the delimitating effect of parasites to animal productivity and the lack of information on the parasite in Sokoto and it's environs, the current study was, embarked on occurrence and identification of parasite in the liver and bile ducts of animals slaughtered at Sokoto abattoir, Sokoto State-Nigeria, with a view to providing epidemiological baseline data that can be used to ensure efficient and effective control of the disease in the study area.

MATERIALS AND METHODS:

Study Area

The study was carried out in Sokoto State abbatoir located in the capital city of Sokoto. Sokoto is a city located in the extreme north- west of Nigeria. As of 2006, it has a population of 427,760.Sokoto city of Nigeria lies on the geographical co-ordinates 13^0 3^05^0N,5 13^0S 3^0E.The inhabitant of the city are predominantly Hausa and Fulani and few minority tribes. Farming, Cattle, Rearing, Buying and Selling are the major occupational activities of the indigenous peoples.

Sample Collection

Bile samples were collected from animals slaughtered at Sokotoabbatoir. The investigation was conducted within the first half of 2017, by randomly examining 250 Animals slaughtered at the Sokoto state abattoir, bile was collected into 250 ml. bottles, directly from the gall bladder of each of the animal and labelled for proper identification. The samples for corresponding animal, as well as the breed, sex, were also recorded. Samples were preserved in a refrigerator and were processed within 24 hours of collection.

Sample Analysis

From the gall bladder,2 mL of the bile was collected using 18-gauge hypodermic needle. The bile sample was then poured into a labelled test tube in a test tube rack. 1 mL of 10% formalin was added using 18-gauge hypodermic needle and syringe into the bile sample and then allowed to stand for 5 minutes. Diethyl-ether (1 mL) was then added in the test tube after 5 minutes using a different 18-gauge hypodermic needle and syringe. The test tube containing the solution was then corked and shaken to mix the solution. The solution was then centrifuged at 2000 rpm for 10 minutes. The eggs/cysts of the parasites sediment at the bottom of the mixture, while diethyl-ether with some fat comes up as supernatant. The supernatant was decanted leaving few of it with the sediment. Drops (1-2) of the sediment were put on a glass slide and covered with a cover slip and viewed under microscope using ×100 magnification for the detection of eggs and smaller parasites (Cheesbrough, 1980). The larger parasites were picked by forceps and placed in a petri-dish containing 2-3 drops of formalin and kept for an hour; after which they were fully extended with the head free. They were then washed thoroughly under running tap water and stored for identification. The anterior or head region of the parasites were cut off and placed on slide, mounted in lactophenol, and examined under light microscope for the shape of the head, size, numbers and location of t the suckers and scolex. Identification of parasite was done using Systemahelminthum (Yamaguti, 1958).Data generated was analysed and tables were drawn.

RESULT

The result of this study showed that, out of the 250 animals examined, 74 (29.6%) were found infected with *F. hepatica*.

The animal group distribution showed that, sheep had the highest prevalence of 34.4%, followed by cattle with 29.27% and then goats with 24.36% (table 1) .

The sex distribution of the infections showed that, the female cattle had high prevalence of 33.33% compared to male with 24.32%.

However, a chi square test showed that there was a significant difference in infection between the males and females ($p<0.05$).among sheep group, males had 20% infection rate than Females who had 24% infection (12 infected out of 50). In the case of goat, 27.8% male and 28.6% females were infected; however, there was no significant difference was seen statistically (table 2).

DISCUSSION

Fascioliasis and other helminthes infections had been reported in Northern Nigeria. The moderately high prevalence of the disease among animal slaughteredat

Table 1: Prevalence of fascioliasis among animals slaughtered at Sokoto Abbatoir.

ANIMALS	NO. EXAMINED	NO. INFECTED	PREVALENCE %
Cattle	82	24	29.27%
Sheep	90	31	34.4%
Goats	78	19	24.36%
TOTAL	250	74	29.6%

Table 2: Sex specific prevalence rate of fascioliasis among the slaughtered animals

ANIMALS	NO. EXAMINED	NO. INFECTED Males Prevalence%	NO INFECTED Females Prevalence%
CATTLE	82	37(9)24.3	45(15)33.3
SHEEP	90	40(8)20.0	50(12)24.0
GOAT	78	36(10)27.8	42(12)28.6

Sokoto abattoir is not surprising. The 29.6% prevalence of fascioliasis obtained in the study agrees with the result of *(*Adedokun*et al.*, 2000*).* The distribution of the disease according to sex had shown that female cattle were more affected than the males. Despite male and female animals grazing together in the same pasture, female had a higher infection rate than male cattle, suggesting that difference in susceptibility between sexes may exist *(*Mas-Coma *et al.,* 2005*)*. Another possible explanation to the variation could be due to the fact that the females stay longer in the herd (for purpose of reproduction and breeding) and hence the higher burden of this disease they bear; other disparity in susceptibility to helminth infection between the 2 sexes could be attributed to the differences in the host intrinsic factors (genetics, physiology, and immunology) and extrinsic factors (environment and management practices) (Magaji*et al*., 2014).

The highest infection rate in the present study was recorded in sheep with 34.4% ; followed by cattle with 29.27% and then Goat with 24.36%. however this reporting is very low in camparison to Beu*et al*., 2007; who reported a prevalence of 80% from Zaria, Nigeria and (Schillhorn*et al.,* 1980) who reported 65.4% prevalence of this disease. In a similar study carried out in Dasht Room County Iran, however, the prevalence of infection in sheep was (17.71%) in cattle (16.71%) and in goats which was 11.69% *(*Mason*,* 2004*);* which is less than our current reporting*.* The high prevalence in sheep and cattle can be attributed to their feeding habits as compared to that of goats whichbrowse on shrubs. The intensity of *Fasciola hepatica* eggs was more in sheep than in goats. The variation in the prevalence among species may be explained by the fact that sheep have indiscriminate type of grazing behaviour while goats are selective grazers which reduced the chance of exposure to infective stage of *F. hepatica* which is commonly found on grasses around marshy areas.

Also sheep are social animals hence they graze along with cattle in the Fadamas and this may increase the chances of infection. Higher numbers with *F. hepatica* eggs was observed in animals with poor body conditions of both sheep and goats; followed by medium body condition and lowest number of *F. hepatica* eggs were recorded in good body condition animals. Therefore these findings could suggest the importance of fascioliasis in causing weight loss and emaciation as a characteristic sign of the disease.

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