

Prevalence of Fascioliasis and Histopathology of Liver Sample of Cattles Slaughtered in Three Abattoirs in Ilaro, Ogun State

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Abstract: Fascioliasis is an infectious parasitic disease infecting domestic ruminants thereby reducing animal productivity, weight gain and production of meat and milk. Human can become infected by ingesting metacercariae from undercooked meat or raw meat of cattle. This study was carried out to determine the prevalence of fasciola hepatica and to examine the histopathology (lesion and inflammation) of the liver samples in cattle. The study was undertaken in three abattoirs (Sabo, Sayedero and Ike-oluwa), sixty (60) slaughtered cattles were randomly selected and their livers were examined, 10 samples each of cow and bulls were selected from the abattoirs. Out of the 60 samples, 20 liver samples were infected. By examination, the result obtained from the study shows that the total prevalence of fascioliasis was 25% (5/20) in Sabo, 30% (6/20) in Sayedero and 45% (9/20) in Ike-Oluwa abattoir. The prevalence of fascioliasis in Cows was 30% and in Bull was 20% from Sabo while 30% in Cows and 30% in Bulls were recorded from Sayedero and 50% in the Cows and 40% in the Bulls were recorded from Ike-Oluwa. From the histopathological result, some of the livers from the abattoir shows lesions, fibrous, necrosis and inflammations of the liver samples.

Keywords: Fascioliasis, Histopathology, Liver, cattle, abattoirs

Introduction

In sub-saharan Africa, ruminants are important source of food to human, contributing immensely to animal protein products. Despite being an integral part of protein source to man, they are greatly affected by various parasitic diseases which most times suppresses the expression of their full production potential and subsequently affecting their consumption for human. Among the common parasites affecting bovine species is liver fluke. Liver fluke is an important parasite of bovine causing Fascioliosis. Fascioliosis is caused by two liver fluke species namely *Fasciola hepatica* and *Fasciola gigantica* (Trematoda). *Fasciola hepatica* has a worldwide distribution, with the specie of *F. gigantica* mostly common in tropical region of the world, mainly Africa and part of Asia (Mas-Coma *et al.*, 2005). Fascioliasis is an important worldwide zoonotic helminthic disease in which the parasite have a particular type of snail as their intermediate host. Humans can accidentally ingest the larvae through the consumption of undercooked meat and become infected (Biu *et al.*, 2006). There is rapid increase in the case of fascioliosis and this is largely dependent on human activities. The development of the fluke is largely dependent on the interaction of the definitive and intermediate host with the external environment and fresh water. Research has shown that fascioliosis is a re-emerging zoonotic disease affecting people in large number (Estaban *et al.*, 2003). In Nigeria,

especially the Northern region, fascioliasis is of economic importance where stagnant water are used for irrigation and 'fadamas' serve as grazing sites for ruminants during dry season (Odetokun *et al.*, 2014). This study aims to examine the prevalence of fascioliasis infections in the liver of cattles slaughtered in some selected abattoirs in Ilaro and to examine the histopathology in the livers of the cattle.

Materials and Methods

The study was conducted using three known abattoirs (Sabo, Sayedero and Ike-Oluwa) within Ilaro, Ogun State between the month of April, May and June 2019. 60 cattles (20 from each abattoir) slaughtered were randomly examined. Fresh liver samples were collected from each of the cattle slaughtered at the early hours of the morning from 6am to 8am into clean polyethylene bags. Each of the polyethylene bag containing samples were carefully labelled for proper identification and transferred to the laboratory for further examination.

2.2 Materials

Gloves, polythene bags, petri dish, 5mL-gauge hypodermic needle and syringe, glass slides, cover slips, test tubes, two transparent container, weighing balance, microscope, test-tube racks, stop watch, Tissue paper, Spatula, Siever, paper tape, Pasteur pipette and centrifuge

Reagents: Distilled water, 10% formalin and Diethyl-ether, formal saline, alcohol, haematoxin, paraffin wax.

2.3 Collection and Inspection of Liver tissue samples

- Liver samples were collected and inspected immediately by visual examination and palpation.
- Whole liver samples were incised at the ventral parts, the bile ducts were cut open to scrutinize thoroughly for the presence of liver fluke.
- Liver samples were confirmed free from other parasites aside liver fluke by qualified veterinary officer.
- The liver samples collected were subjected to proper histopathological process.

2.4 Histological Preparation of Liver Tissues

- Infected liver samples of cattles were cut into sizes of about 5g.
- Each of the samples were placed in different sample bottles and taken to the laboratory for analysis using the methods described by Chessbrough (Chessbrough, 2005).

Results

The results from the tables below shows the prevalence of fascioliasis in the liver sample of male and female cattles slaughtered at Sabo, Sayedero and Ike-Oluwa abattoir in Ilaro, Ogun state

Table 1: Prevalence of fascioliasis in liver sample of cattle slaughtered in Ilaro Abattoir

| Abattoir examined | Number examined | Number infected | Number uninfected |
|-------------------|-----------------|-----------------|-------------------|
| Sabo | 20 | 5 | 15 |
| Sayedero | 20 | 6 | 14 |
| Ike oluwa | 20 | 9 | 11 |
| Total | 60 | 20 | 40 |

Table 2: Prevalence of infected liver samples examined in Ilaro abattoir

| Abattoir examined | Number examined | Number infected | Prevalence (%) |
|-------------------|-----------------|-----------------|----------------|
| Sabo | 20 | 5 | 25 |
| Sayedero | 20 | 6 | 30 |
| Ike oluwa | 20 | 9 | 45 |
| Total | 60 | 20 | |

Table 3: Prevalence of fascioliasis in liver samples of cow and bull slaughtered at Sabo Abattoir

| Relation to sex | Number examined | Negative | Positive | Prevalence (%) |
|-----------------|-----------------|----------|----------|----------------|
| Cow | 10 | 7 | 3 | 30% |
| Bull | 10 | 8 | 2 | 20% |

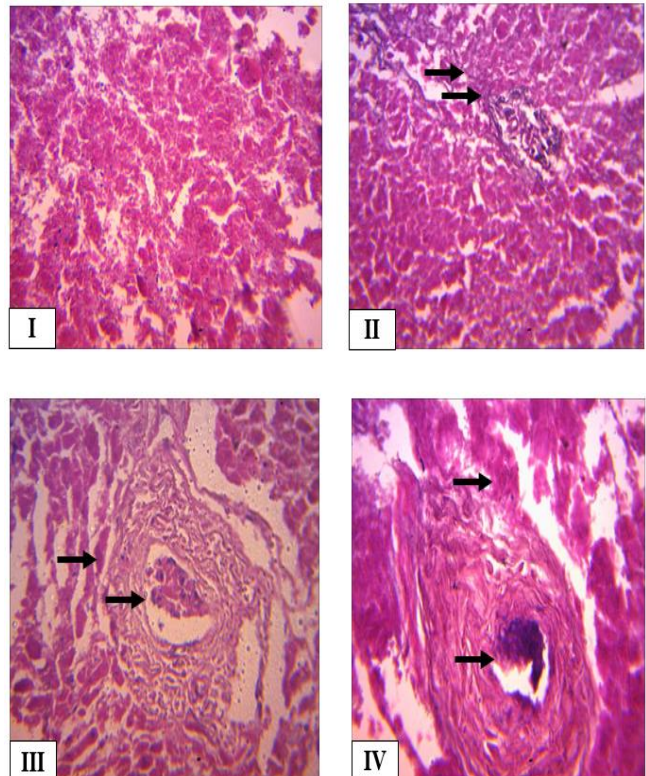
Table 4: Prevalence of fascioliasis in liver samples of Cow and Bull slaughtered at Sayedero abattoir

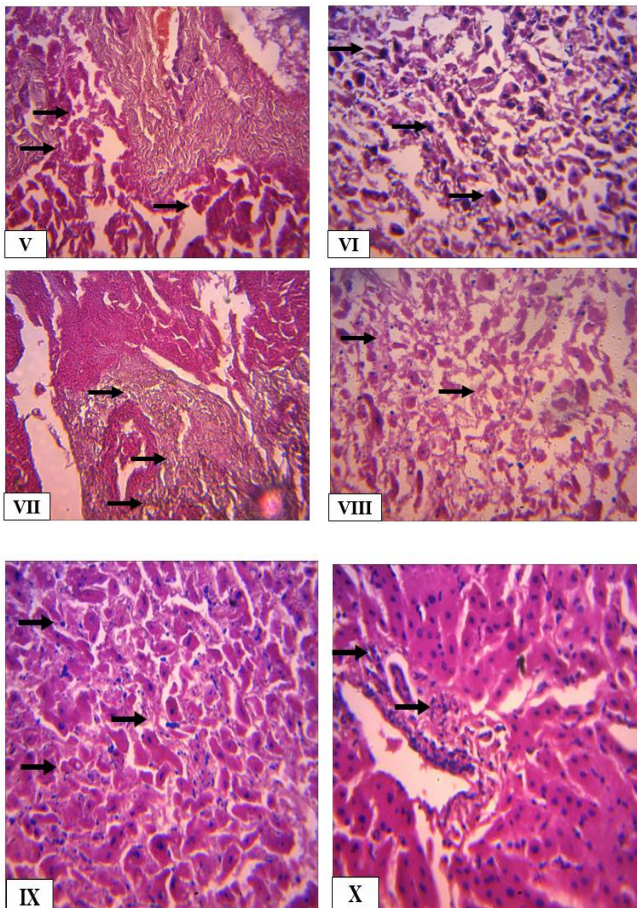
| Relation to sex | Number examined | Negative | Positive | Prevalence (%) |
|-----------------|-----------------|----------|----------|----------------|
| Cow | 10 | 7 | 3 | 30% |
| Bull | 10 | 7 | 3 | 30% |

Table 5: Prevalence of fascioliasis in liver sample of Cow and Bull slaughtered at Ike-Oluwa abattoir

| Relation to sex | Number examined | Negative | Positive | Prevalence (%) |
|-----------------|-----------------|----------|----------|----------------|
| Cow | 10 | 5 | 5 | 50% |
| Bull | 10 | 6 | 4 | 40% |

3.1 Histopathological Result





- Plate I:** No visible lesions seen
Plate II: The portal area is slightly prominent, with mild to moderate periportal cellular infiltration (arrows).
Plate III: There is an extensive laydown of fibrous connective tissue around the periportal are (arrows)
Plate IV: There is an extensive laydown of fibrous connective tissue around the periportal are (arrows)
Plate V: There is an extensive laydown of fibrous connective tissue around the periportal are (arrows)
Plate VI: Hepatocytes appeared diffusely distorted and individualized (arrows)
Plate VII: There is an extensive lay down of fibrous connective tissue around the periportal are (arrows)
Plate VIII: There is a severe diffuse vacuolar degeneration and necrosis of hepatocytes (arrows)
Plate IX: There is a moderate diffuse cellular infiltration of the hepatic parenchyma (arrows)
Plate X: There is a very mild periportal cellular infiltration (arrows)

Discussion

Fascioliasis is a very critical disease in cattle which has a huge economic losses and industrial losses in terms of meat, milk and leather in Nigeria. It is a zoonotic helminthes worldwide. Animals acquire it the infection by eating vegetables containing metacercariae. Humans become infected by ingesting metacercariae from undercooked meat or raw meat of cattle. This study was carried out to determine the prevalence of fascioliasis and

the histopathology of the liver in cattle sold in Ilaro. By examination it was shown that there is presence of *f. hepatica* in some of the liver samples of the cows and bulls gotten from the three abattoir. The result from the study shows that the total prevalence of fascioliasis in Ike-Oluwa abattoir was the highest (45%) followed by that of Sayedero (30%) while the least was observed at Sabo abattoir (25%) as shown in the table. Various factors such as irrigation, season of grazing and the frequency of grazing in the respective season, frequency of exposure of animals to parasite and the geographical distribution of animals could be responsible for the presence of fascioliasis in cattle (Soliman, 2008).

The histopathological result of the infected liver shows various abnormalities in the nucleus ranging from pale colouration, swollen portions signaling fibrosis, distribution of dark patches over the parietal surface and pipe stem appearance of the liver. Dilation of the central vein was observed with the retention of debris indicating poor functionality of the liver such as reduced efficiency in protein synthesis. This observation corroborate the work of Talukder *et al.*, (2010). Hepatic cell damage observed may be due to the feeding pattern of parasites. Njoku and Okoli, (2011) reported similar histopathological result. Appearance of pipe stem in the cross section of some livers could be due to the migration of the parasites. Ansari-Lari and Moazzeni, 2006 also reported similar result. Fibrosis connective tissue amplification were seen at the portal regions with hemorrhage. This is similar to the report of (Coppo *et al.*, 2011; Usip *et al.*, 2014). Lofty *et al.*, 2003 reported the degenerative changes in the hepatocytes and biliary cirrhosis in the histopathological examination of the liver of cattle infected with fasciola.

Result from this study also shows that, female cattles examined have slightly higher level of fascioliasis compared to the bull. Rahman and Collins, (1992) also documented similar reports.

Conclusion

Depending on the grade of intensity, histopathological changes in the livers of the cattle infected with fascioliasis reflects tissue damage which can result to significant losses in animals, loss of profits to farmers due to rejection by animal health inspection agents and may ultimately create huge health problems to the public.

Therefore, animal keepers must carefully observe the right time to graze their animals so as to reduce the occurrence of animals coming in contact with the secondary host (snail).

References

- Ansari-Lari, M. and Moazzeni, M. (2006). A retrospective survey of liver fluke disease in



- livestock based abattoir data in Shiraz, South Iran. *Prev. Veterinary medicine*. 73(1) 93- 96.
- Biu, A. A. and Ahmed, M. I. and Mshelia, S. S. (2006). Economic assessment of losses due to parasitic diseases common at the Maiduguri abattoir Nigeria. *International Journal of Biomedical and Health Sciences* 2(2):81-83.
- Esteban, J. G., Gonzalez, C., Curtale, F., Munoz-Antoli, C., Valero, M. A. and Bargues, M. (2003). Hyperendemic fascioliasis associated with schistosomiasis in villages Nile Delta of Egypt. *Am Journal of Tropical and Medical Hygiene*. 69(4): 429-437.
- Lofty, M. W and Hillyer, G. V. (2003). Fasciolia species in Egypt. *Experimental Pathology and Parasitology*. 6(11): 9-22.
- Mas-Coma, S., Bargues, M. D. and Valero, M. A. (2005). Fascioliasis and other plant-borne trematode zoonoses. *International journal of parasitology*. Vol.35, No.11-12.
- Njoku-Tony, R. F. and Okoli, C. G. (2011). Prevalence of fascioliasis among slaughtered sheep in selected abattoirs in Imo State, Nigeria. *Journal of American Science*, 7(2): 361-366.
- Odetokun, I. A., Oladele-Bukola, M. O. and Ishaya, T. (2014). Prevalence of Bovine fascioliasis the Ibadan municipal abattoir, Nigeria. *African Journal of Food, Agriculture, Nutrition and Development*, 14(4): 9055-9070.
- Rahman, W. A. and Collins, G. A., 1992. An association of faecal egg counts and prolatic concentrations in sera of peri-parturient Angora goats. *Veterinary Parasitology*. 23: 85-91.
- Soliman, F. (2008). Epidemiology review of human and animal fascioliasis in Egypt. *Journal of infection in developing countries*, 2(3): 182-189.
- Talukder, S., Bhuiyan, M. J., Hossain, M. M., Viddin, M. M., Paul, S. and Howler, M. M. (2010). Pathology investigation of liver fluke infection of slaughtered black Bengal goat in a selected area of Bangladesh. *Banglesh Veterinary Medicine*. 8(1): 35-40.
- Usip, L. P., Ibang, E. S, Edodo, H. J., Amadi, E. C. and Utah, E. (2014). Prevalence of fascioliasis and

the economic loss of condemned liver due to fascioliasis infection in cattle slaughtered at three abattoir in Eket Urban, Akwa Ibom State of Nigeria.