

THE PREVALENCE OF LIVER FLUKE (*Fasciola Gigantica*) INFECTION OF CATTLE IN ISOKO NORTH AND SOUTH LOCAL GOVERNMENT AREAS, DELTA STATE, NIGERIA.

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ABSTRACT

The prevalence of fascioliasis in cattle slaughtered in Isoko North and South Local Government Areas of Delta State was studied. The species of importance was *fasciola gigantica*. There were two phases of the study. In the first phase a retrospective analysis was made on the monthly abattoir records from different towns in Isoko North and South Local Government Areas from January 2003 to December 2004 kept by the veterinary division of the Delta State Ministry of Agriculture and Food Production (MAFP). The second phase involves actual meat inspection at the Isoko North and South abattoir from August to October, 2013. In the first phase, the result shows that only seven of the towns in Isoko North and South Local Government Areas had complete figures of cases of fascioliasis in cattle, and the prevalence rates were quite significant ranging 0.06% in Owhelegbo to 0.073% in Oleh town in Isoko North and South Local Government Area. The overall prevalence rate of fascioliasis in cattle for the whole area during the one year period was 0.486%. In the second phase 486 of the 1444 cattle examined were infected with fascioliasis giving a prevalence rate of 0.38% for the period. The liver was found to be the predilection site.

Keywords: Prevalence, Fascioliasis, Abattoir, Retrospective, *Fasciola Gigantica*.

INTRODUCTION

Cattle industries are beset by prevalence of liver fluke (*fasciola gigantica*) infection. These parasitic diseases are not without deleterious effect on man. The high rate of this incidence will amount to reduction of cattle distribution in the State. The optimal demand of beef among Deltans boosts high production of cattle in the North with a view to making animal protein available for the populace. The majority of these cattle are kept under free-range system of management in rural areas of the State before slaughtering. This management system enhances the risk of acquiring infection with *fasciola gigantica*. Cattle, accidentally, serve as definitive hosts to the parasitic helminthes trematode of the family, fasciolidae, commonly known as liver flukes. There are various species of these but the economically important ones are *fasciola gigantica* in the tropics and *fasciola hepatica* in the temperate region

(Ikeme, 1990). There is great variance in the seasonal distribution of the prevalence of fascioliasis and the farming and grazing system in the country further enhances it. *Fascioliasis* tends to be endemic in certain parts of the country where rainfall is high and reliable. The prevalence varies from season to season (Soulby; 1968). *Fasciola gigantica* resembles any other species of fasciola but is readily recognized by its large size being 25-75mm in length and up to 12mm in width. The anterior cone is prominent and the body is more transparent. The eggs measured 140-75Nm (Soulby, 1968). Grazing cattle pick the infection by swallowing the infected cercariae along with the plants or drinking water containing them. Excystation usually occurs in the duodenum within 24 hours of infection, immature trematodes occur in the abdominal cavity, and 4-6 days the majority has penetrated the liver capsule and migrates into the liver parenchyma. Some young flukes reach the liver via the blood stream. In 5-7 weeks, they enter the bile ducts and reach sexual maturity. From 8 weeks onwards, eggs are found in the bile and subsequently in faeces. In cattle, immature flukes may be carried to the organs such as lungs and in pregnant cow to the foetus (Soulby, 1968). From the foregoing, it can be seen that *fascioliasis* can be hazardous on farm. In case of outbreak, it can wipe out a whole herd of cattle, resulting in economic loss and potential risk to human health. Hence, special emphasis is placed on its prevention than control.

Although, hundreds of thousands of cattle are slaughtered for human consumption in Delta State each year, yet no survey has been done to determine the prevalence of these flukes in the species of the feed animals. The objective of this study is to ascertain the prevalence of *fasciola gigantica* on cattle slaughtered in abattoir of different local Government areas of Delta State. This investigation will not only show the necessity for the routine monitoring and surveillance of this parasite infection in the species of the feed animal, but also make it possible to assess the potential public health and economic importance.

MATERIALS AND METHODS

This study was in two phases. Phase one was concern with the examination and analysis of the meat inspection returns from the month of August to October 2013 from seven towns in Isoko North and South Local Government Areas, Delta State. Meat inspections at the various units in each of these chosen towns in the local government areas make monthly returns of meat inspection to the veterinary headquarters. The data used for this part of the work were collected from such returns from January 2003 to December, 2004. The following information were obtained from the records: (i) the total number of cattle slaughtered in each town per month during the period of this study, (ii) the number of such slaughtered cattle that were

infected with *fasciola gigantica*. The monthly and annual prevalence rates for infection were calculated for each town using these data. While the overall prevalence rate (2003-2004) for the infections were also calculated for each town. The monthly values for the Local Government Area were then grouped into two seasons (rainy and dry seasons) and the prevalence rate for the two seasons was calculated for statistical evaluations. Tables, graphs, bar charts, percentage and frequency were used in the presentation of these results.

In second phase, the abattoir at Isoko North and South urban market that serves the rural-urban communities in the two Local Government Areas and Polytechnic community with approximately 1501 (35%) cattle slaughtered there each month, was visited everyday starting from the 1st of August to 31st of October 2013. Inspection was done between 6.00am to 7.00am. For the detection of *fasciola gigantica* flukes in cattle and emphasis were placed on the liver which was inspected by post-mortem approach. The liver is usually observed for changes in colour such as case of abscesses, cirrhosis, fatty change, congestion, discoloration etc. It is then palpated to feel inconsistency. Finally, it is incised to check for flukes. The liver was pressed in different areas to expose flukes hidden into the duct. The bile duct was incised to expose the flukes. In positive cases, the liver was noticed to be thickened and enlarged especially at the area of the bile ducts. The ducts were seemed to contain liver flukes. It was noticed that the ventral lobe of the liver was always more heavily infected than the other parts.

RESULT AND DISCUSSION

The first phase of this survey showed that *fasciola gigantica* was relatively common in cattle in the two Local Government Areas for the period under study. The overall prevalent rates for this fluke in cattle during the 3 months period covered by this survey were 0.96-1.42%. Table 1 shows the overall monthly prevalence of *fascioliasis* in the Local Government Areas during the period covered by the study (August-October, 2013) was statistically significant and range from 60%-73%. The prevalence rates were August (60%), September (73.67%) and October (69%), to its highest and lowest in the month. Since it is toward the end of rainy season, there seems to be a consistent fluctuation in the prevalence rates through the months. This certainly does not agree with the life cycle of the parasite. However, as usual, the highest prevalence rate is recorded in September (3.00%), which is one of the heaviest months in terms of rainy season in the country (fig 2). From the statistical analysis, however, a significant difference was established in the prevalence of *fascioliasis* in the rainy season in the cattle indicating that *fasciola gigantica* is more common in the environment during the rainy season. The overall prevalence of *fasciola gigantica* in cattle in the different towns of Isoko North and South L.G. A are shown in table 1. The entire seven towns in the Local Government Areas for which records were available reported

evidence of *fascioliasis*. The overall prevalent rates were generally significant. It was observed from the result that although the prevalent rates of the infection were generally moderate, there was also some degree of variations from one town in the area to another as shown in table 2. These variations may have resulted from differences in the zeal, level of competence and experience of meat inspectors in the area. These may have greatly influenced the records from different towns in the area. The absence of data from any of these towns in Isoko North and South arises from failure by the meat inspectors to officially examine the animals and make proper returns of findings of such examination, or by misplacement of such data in the Ministry of Agriculture. At the moment, members of well trained and qualified meat inspectors are in adequate some of the towns get these few well trained personnel while others do not have.

Therefore, there are bound to be differences in the nature of data they submit. Moreover, it is possible that those who engage in the meat inspection on the field for infection may either report false positives or false negatives. In some instances, there is evidence that *fasciola gigantica* infection is deliberately ignored by meat inspectors because they regard it not to be of great zoonotic importance. This appears to be responsible for the 0% prevalence rate recorded in Isoko North and South for the infection during August-October, 2013 (table 3). As stated previously, facilities (trained staff, modern abattoir, etc) available for meat inspection in the area are inadequate, generally poor and vary from one town to another. Some towns such as Isoko are better than others in this regard. It is probable that the quality of work done at the various towns will be influenced by the facilities available for meat inspection.

In the second phase, *fasciola gigantica* was consistently found during the period of the study, with September recording the highest prevalence, 3.00 cases out of 211 (1.42%). August had 1.78 cases out of the 185 cattle slaughtered, this represent prevalence rate of 0.96%, while October had 1.91 cases out of 192 cattle slaughtered representing prevalence rate of 0.99%. These figures contrast sharply with figures calculated for the same abattoir for similar months from August-October, 2013 (table 3). The overall prevalence of *fascioliasis* during the period of three months in 2013 was 0.38% representing 2.23 positive cases out of the 588 cattles examined. Again, this is at various slaughters with the 0% prevalence rate record in the abattoir for the corresponding three months of August-October 2013 by the Ministry of Agriculture and Food Production, Oleh, Delta State. The 201 prevalence of *fasciola gigantica* agreed significantly with the findings of Dada and Belino (1977) who found the prevalence rate of *fasciola gigantica* to be less than 1.09% in cattle for Jos, Plateau area of Northern Nigeria. It's also at variance with findings from other parts of African such as Kenya

(El azazy and Fayek, 1982). 21.7% for Nyanza (Kenya) by Cheruiyot (1982); 10.7%-32.9% for Cuba (Dobsink 1968), 9.8% - 23.0% and 60% for Saint Lucia and Haiti (Banish 1979) and Gentideni(1965).

CONCLUSION

The prevalence of *fasciola gigantica* in cattle slaughtered in Isoko North and South Local Government Areas is relatively low compared to the situation in many Northern States of Nigeria. It was observed that *fascioliasis* is generally common in cattle slaughtered in Isoko North and South. The official figure for the prevalence of *fasciola gigantica* in cattle for Isoko significantly underestimated the true situation. This is also probably true of the figures for other towns in the area. Finally, it is suggested that provision of modern and improved meat inspection facilities in all parts of the area and better training of veterinarians and meat inspectors, who should be handsomely remunerated are necessary for proper and accurate surveillance of this and other zoonoses found in our feed animals.

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Table 1: Prevalence Rates of Fascioliasis in Cattle Retarded in Different Towns of Isoko North and South L.G A (August-October, 2013).

Towns	August	September	October	Total	Overall (%) Prevalence
Ozoro	73 2.06%	74 3.13%	71 2.0%	218	72.67
Oleh	72 2.0%	72 3.06%	76 2.0	220	73.33
Olomoro	64 1.7%	75 3.17%	74 2.06%	213	70.33
Otor-owhe	63 1.7%	73 3.1%	62 1.7%	198	70.33
Lyede	58 1.5%	60 2.7%	70 1.9%	188	70.00
Owhelogbo	62 1.7%	75 3.17%	70 1.9%	207	60.00
Irri	65 1.8%	60 2.7%	66 1.8%	191	69.00
Mean total	65.28 1.78%	69.86 3.00%	69.86 1.91%	20 5 .1435	485.66

Table 2: Monthly Prevalence of Fascioliasis Investigation in Cattle in Isoko North and South Areas (August-October 2013).

Town	August		September		October		Total	Overall %No. of Cattle slaughtered
	Case	No. of Cattle Slaughtered	Case	No. of Cattle Slaughtered	Case	No. of Cattle Slaughtered		
Ozoro	73	218	64	185	71	196	599	203.67
Oleh	72	248	72	297	76	200	745	231.57
Olomoro	64	199	75	200	74	190	589	203.57
Otor-owhe	63	217	73	300	62	190	707	201.67
lyede	58	185	60	167	70	180	532	198.60
Owhelogbo	62	211	75	179	70	193	583	203.56
Irri	65	211	60	179	66	185	575	201.67
Total	457	1489	489	1507	489	1334	4330	1444.31

Table 3: Comparative Prevalence Rate of Fascioliasis in Cattle Slaughtered at Isoko North and South Abattoir from August to October 2013.

Sources of Data	August	September	October	Total
Abattoir record from August-October, 2003	1489	1507	1334	4330
Present survey from August-October, 2013	1.78/185 (0.96%)	3.00/211 (1.42%)	1.91/192 (0.99%)	2.25/588 (0.38%)

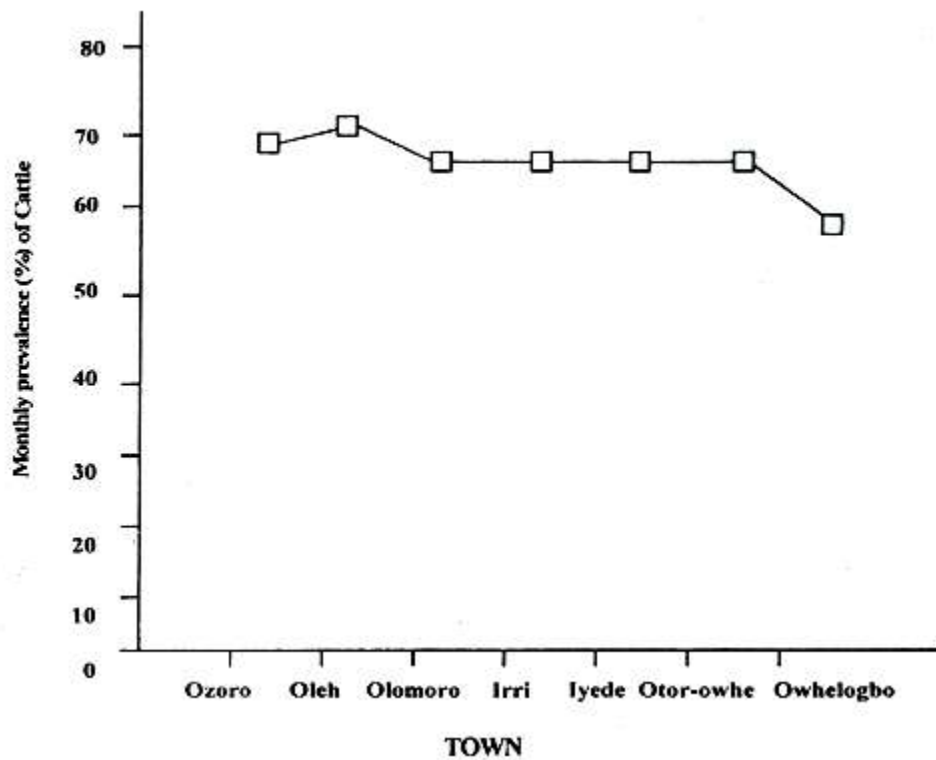


Fig 1: Seasonal Occurrence of Fascioliasis Investigation in Cattle in Isoko North and South L.G.A. (August to October, 2013).

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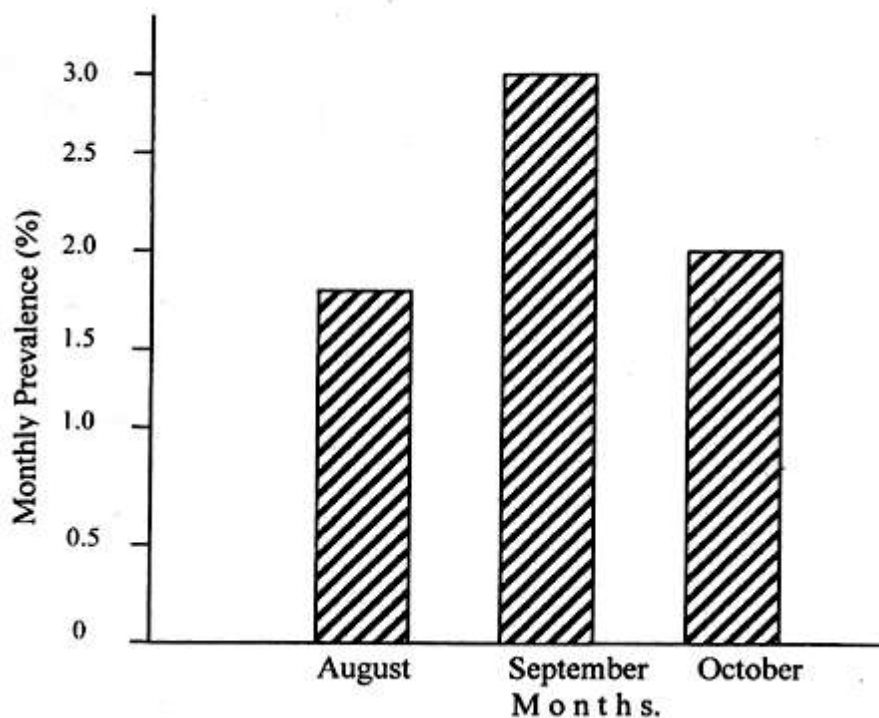


Fig 2: Monthly Prevalence of Fascioliasis Investigation in Cattle in Isoko North and South Local Government Areas (August - October, 2013).

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