PREVALENCE OF *Fasciola gigantica, Cysticercus bovis* AND SOME OTHER DISEASE CONDITIONS OF CATTLE SLAUGHTERED IN NSUKKA URBAN ABATTOIR

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ABSTRACT

The prevalence of some parasitic infections and other disease conditions of cattle slaughtered in Nsukka urban abattoir was studied from November to December 2001. The tongues, hearts, masseter muscles, intercostal muscles, lungs, spleens, and livers of cattle were examined for various parasitic infections and disease conditions. The examinations were done by dissection, palpation and other physical procedures. Of the organs examined, the lungs, spleen, and liver were infected. The only case of Cysticercus bovis infection found was in a liver. Also, all cases of Fasciola infections were detected from the liver. Cases of tuberculosis and pneumonia were detected from the lungs. Other disease conditions seen were splenomegaly, jaundice, and telangiactasis. Out of the 150 cattle examined, 30 (20%) were infected or have disease. A total of 150 cattle comprising 116 males and 34 females were examined. The distribution of infections is as follows: 1(0.70%) was infected with Cysticercus bovis, 15 (10%) with Fasciola gigantica, 4 (2.70%) with tuberculosis. Other disease conditions include 2 (1.33%) with pneumonia, 3(2%) with telangiactasis, 2(1.33%) with splenomegaly and 2(1.33%) with jaundice. The overall prevalence of the conditions studied in the slaughtered cattle include Cysticercosis bovis 3.33%, Fascioliasis 50%, tuberculosis 13.33%, pneumonia 6.67%, telangiactasis 10%, splenomegaly 6.67% and jaundice 6.67%.

Key Words: Prevalence, *Fasciola gigantica, Cysticercus bovis,* Cattle, disease.

INTRODUCTION

Cattle rearing form a substantial part of agriculture not only because cattle are a rich source of food (blood, milk and meat) but also a source of industrial raw materials (horn, hair and hide). The major tropical and subtropical areas of Asia, Africa, South and Central America contain approximately 66 per cent of the world's cattle (Andrews *et al;* 1992). The tropics, however, produce only 30-40 per cent of the world's beef and veal and 20-25 per cent of the world's milk. This low productivity has been traced to parasitic disease infection. This discrepancy represents a challenge for those in tropical cattle management, since the tropics have many advantages for bovine production. These include: a potential year-round growing season in the absence of very low temperatures, grass species capable of greater energy capture and dry matter yields than temperate grasses, vast land areas unutilized or underutilized, labour availability with strong animal keeping traditions, many locally adapted breeds that have been selected for production in adverse environments (Andrews *et al.,* 1992). However, these advantages are counteracted by many constraints of which different animal diseases are major causes. Most popular causes of these diseases are viruses, bacteria, protozoa, helminths and arthropods. According to Onah and Chiejina (1986), because of the absence of well-established veterinary diagnostic services, abattoir statistics have become the single most important source of data on diseases of food animals in Nigeria. This is particularly true of those diseases that can only be reliably diagnosed through post mortem examination such as *taeniasis,* fascioliasis etc. They also showed that surveys carried out at a number of abattoirs in northern Nigeria suggest that the infection with parasite like *Teania saginata* cysticercus is very common in Nigerian cattle.

Studies carried out in Imo state, Nigeria, by Okafor (1988) shows that this is especially so during the mid-dry season months (December to February).

The health of Nigerian populace is therefore at risk as long as these diseased cattle are slaughtered and consumed by the people unless appropriate meat inspection policy is adopted to check the spread of these zoonotic diseases. Also of importance is the need to find appropriate chemotherapeutic and control measures for these parasitic diseases.

The main objective of the study is to determine the prevalence of *Fasciola gigantica* and *Cysticercus bovis* and some disease conditions of public health importance in the Nsukka urban abattoir.

MATERIALS AND METHODS

The Study Site and Cattle: The study site was Nsukka urban abattoir. The cattle slaughtered in Nsukka urban abattoir were bought off the Hausa and Fulani herdsmen from the northern part of Nigeria. These herdsmen or their agents brought them down to Nsukka in lorries. However, because the cattle were not slaughtered as soon as they arrived, they were made to trek to places of pasture within Nsukka area.

Examination of the Organs and Tissues for Infections: The study began on 7th November and ended on 8th December 2001. The abattoir was visited twice every week. The inspection of the meat was made possible through the cooperation of the veterinary staff on duty at the abattoir. All the cattle studied were of the White Fulani *(Bunaji),* Sokoto Zebu/gudli and Nigerian Fulani *(Abore)* breed from the northern part of Nigeria. In most abattoirs, meat inspection facilities are inadequate and procedures are not uniform or standardized, and even where reasonably well developed, incision is only limited to certain muscles. The standard that is followed depends on the epidemiological studies that have been carried out in that locality. Each day, the tongue, masseter muscles, heart, lung, spleen, and liver were inspected by viewing, palpating and incising following the routine meat inspection procedures in the abattoir. The livers were examined for *Fasciola* by making length-wise incisions of the ventral side of the liver in such a way that the bile duct is cut open. The examination was then done by pressing the liver with the thumbs while holding it firmly on the slab or bench. The flukes recovered were taken to the laboratory for identification and preservation.

The tongue, masseter muscles, heart, Lung, spleen and liver were carefully viewed, palpated or incised lengthwise for *Cysticercus bovis* infection as well as other disease conditions. The parasites recovered and diseased organs were fixed in 10 % formalin and preserved in the laboratory.

RESULT

Prevalence of Parasites: Of the 150 cattle examined for various parasitic infections and disease conditions, 116 were males while 34 were females. The cattle were a mixture of young and old animals. The only case of *Cysticercus bovis* infection was found in a liver in November. This represented prevalence rate of 0.67%. There were 15 cases of *Fasciola gigantica* (figure 1) infections representing prevalence rate of 10% for the period. Eight (7.48 %) of the infections were detected in November while seven (16.28%) other cases of *Fasciola gigantica* infections were detected in December. The frequency of occurrence of *Fasciola gigantica* infections is shown in Table 1.

Relationship of Parasite Distribution with Sex: This study showed that all the animals infected were males. In November, 107 cattle were examined (79 males and 28 females) out of which 8 males were infected with *Fasciola gigantica* and one male infected with *C. bovis.* The *Fasciola gigantica* infection formed 7.48% with *C. bovis* formed 0.93% of the cattle examined for November. No female was infected. In December, 43 cattle were examined (37 males & 6 females) out of which 7 males (16.28%) were infected with *Fasciola gigantica.* This formed 16.28% of the cattle examined in December. No female was infected. Therefore, the prevalence rate of infections between the sexes examined in this study showed that there was no significant difference in infection between the sexes. (X^2 = 139.3, df = 6, P>0.05).

Prevalence of other Disease conditions in cattle slaughtered in the Abattoir for the Period, November to December: Different types of disease conditions were observed in different organs and muscles of the cattle examined (Table 2). The prevalence rate recorded for jaundice in the study was 1.33% (i.e. two cases). Also, two cases of bronchial

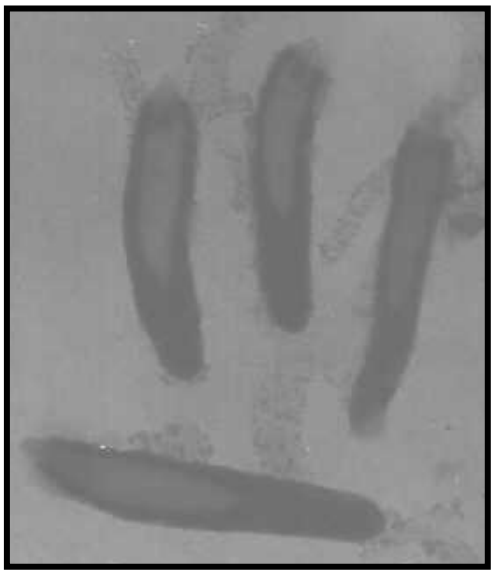

Figure 1: Fasciola gigantica detected from the liver of cattle.

Figure 2: Grossly tubercled lung of cattle.

Table 1: Prevalence of *Fasciola gigantica* and *Cysticercus bovis*

Month	Parasite Detected	Number Examined	Number Infected	Percentage Infection
Nov.	*Fasciola gigantica*	107	8	7.48
	Cysticercus bovis	107	1	0.93
Dec.	*Fasciola gigantica*	43	7	16.28
	Cysticercus bovis	43	0	0%
	TOTAL	300	16	15.33

Table 2: Organ distribution of disease conditions

Disease Condition	Organ infected	Number Examined	Number Infected	Percentage Infection
Jaundice	Skin and internal organ	150	2	1.33
Tuberculosis	Lungs	150	4	2.67
Splenomegaly	Spleen	150	2	1.33
Telangiactasis	Liver	150	2	1.33
Pneumonia	Lungs	150	2	1.33

pneumonia were found (one in a male and one in a female) between November and December. Four male cows were found infected with bovine tuberculosis (figure 2) in November alone. There were no such disease conditions in any cattle examined in December. Three cases of telangiactasis were found (two in males and one in female) in the livers of the cattle in November. There were no such disease conditions in December. The cases of splenomegaly recorded were two (i.e. 1.33%).

DISCUSSION

The purpose of disease surveillance is to use all appropriate epidemiologic and other methods as guide to the control of such disease" (Downs, 1990). This objective was later enlarged to include the evaluation of disease states and provision of data for disease control and health services planning. The first part of the objective is about describing the ongoing pattern of disease occurrence and disease potential. Against this background, the results of this survey should be very relevant in both disease control in cattle and public health controls in the human population. Two parasites were detected in the course of this survey namely *Fasciola gigantica* and *Cysticercus bovis.* These showed prevalence rates of 10.00% and 0.67% respectively. The disease conditions like tuberculosis, pneumonia, splenomegaly, jaundice and telangiactasis were also observed. But there does not seem to be any association

between the prevalence of the helminth parasites and these disease conditions. The occurrence of *Fasciola gigantica* and *Cysticercus bovis* in Nsukka Urban abattoir is not unusual. Ikeme and Obioha (1973) had detected 39% prevalence rate of *Fasciola gigantica* while Onah and Chiejina (1986) detected 2.36% prevalence rate of *Cysticercus bovis* in the same abattoir. Thus this study confirms the persistence of the infection in cattle slaughtered in this market. The prevalence rate of *Fasciola gigantica* (10.00%) in this study is relatively low when compared with the work of Ikeme and Obioha (1973) in the same abattoir where the prevalence rate was recorded as 39%. Also when the prevalence rates found in this study are compared with the prevalence rates in other parts of the world, it is still found to be lower. Although the statistics from the report of Lofti *et al* (1995) for 1987 – 1991 showed a lower prevalence rate of between 4.2 – 6.5% in Assiut abattoir (Egypt). However, other studies cited by Ukoli (1984) show the prevalence rates to vary. For example Gretillat (1961) in Senegal found 30 – 50% while Graber and Outamie (1964) in Niger found 36% and Schillhorn Van Veen *et al; (*1980) in Soba (Zaria rural abattoir) found the rate to be up to 65.4%. This then means that most areas of Africa have prevalence rates much higher than 10.00%. One of the reasons for the low prevalence can be due to the fact that healthier animals now reach the southern market where this study was conducted. The prevalence rate of *Cysticercus bovis* infection is also relatively low. Onah and Chiejina (1986) had earlier reported a higher prevalence rate of 2.36% in Nsukka, Anambra State, Nigeria. Also Okafor (1988) reported a much higher prevalence rate of 26.14% in Imo State Nigeria. The prevalence rates of 19.23% and 17.4% in Bauchi and Borno States of Nigeria reported by Belino (1975) are also higher than the report from this work. Still reports of high prevalence in other parts of the world exist e.g. Aleksic and Miloradovic (1994) reported 2.14% prevalence rate in Poland and Kamparage *et al* (1995) reported 16% prevalence rate in Tanzania. The reason for this drop is not very clear. A drop in exposure due to better management of cattle may not be ruled out. The level of prevalence rate of *F. gigantica* and *C. bovis* infections in this study can be attributed to the age of animals slaughtered. Andrews *et al* (1992) reported that although any age of animal may be susceptible, calves and yearlings are most commonly affected. Quoting Gallie and Sewell (1983), Onah and Chiejina (1986) showed that with increasing age calves develop stronger and more lasting immunity to *T. saginata* metacestode. Therefore, since most of the cattle examined (91.33%) were mature cattle, it may be that this phenomenon is at play. The presence of viable cysts in some of the older animals as reported by Onah and Chiejina (1986) might be as a result of recent infection in animals or persistence from early calf hood infections unaffected by subsequent host immune responses or deviations from the process. The period of this study is another factor that could have influenced the prevalence rate. Egbe-Nwiyi and Chaudrai (1996) reported higher prevalence rate (41.3%) of *Fasciola gigantica* during the rainy season and lower prevalence rate (32.7%) during the post-rainy season periods. Okafor (1988) reported that more cysts of *C. bovis* were isolated during the mid dry season months (December to February) although he attributed this, in the case of rural areas, to a drop in the number of animals slaughtered at these periods of the year. This work which was carried out during the post-rainy season period (November to December) could have been influenced by the season of study. Mode of transportation of the slaughtered cattle from the northern to the southern part of the country could have as well influenced the result. Before 1984, the animals were made to trek to the south from the north. That would mean greater exposure to more grazing grounds and therefore, greater probability of grazing on infected pastures. But with modernized means of transportation in which trailers are used, the cattle are restricted to the rearers choice pasture coupled with their awareness of the economic consequences of leading the cattle to infected grazing grounds.

Finally, the number of veterinary doctors has increased due to increased interest in education which implies that there are now lower ratios of veterinary doctors to the cattle thus giving them better attention medically. This means constant diagnosing and treatment of cases probably accounting for the lower prevalence rates. There was disease conditions also observed during this study which led to partial or total condemnation of carcasses. The prevalence rates of the disease conditions showed that tuberculosis has 2.67% prevalence rate, pneumonia, 1.33%, telangiactasis, 2%, splenomegaly, 1.33%, and jaundice 1.33%. Kamparage *et al* (1995) in a retrospective study (1987-1989) observed that these disease conditions were responsible for the condemnation of whole carcasses and organs in Tanzania. Their work showed higher prevalence rate of some of these disease conditions in the area they studied. The equal prevalence rates

recorded for jaundice and splenomegaly may mean that splenomegaly in the animals may be due to exposure to aetiological agents of jaundice in Nigeria. One of such disease conditions was tuberculosis with prevalence rate of 44%. Konopka (1995) also implicated tuberculosis in the condemnation of carcasses.

CONCLUSION

This work has shown that parasites of zoonotic importance as well as other disease conditions responsible for condemnation of carcasses and organs are prevalent at in cattle slaughtered at Nsukka urban abattoir. Although the prevalence rates of these parasites and disease conditions were moderately low, the public health and economic implications should not be overlooked. It is alarming that unlike in other areas, diseased animal carcasses were not condemned. This situation calls for serious attention of both the veterinary workers and the public health planners in the state. The prevalence of various disease conditions in this abattoir also calls for further studies to determine the remote causes of the disease conditions and to find ways of eliminating them from the cattle slaughtered for human consumption.

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