



Bayero Journal of Pure and Applied Sciences, 11(2): 225 - 228

Received: August, 2018

Accepted: December, 2018

ISSN 2006 – 6996

PRESENT STATUS OF HYDATIDOSIS IN SLAUGHTERED ANIMALS IN KANO CITY ABATTOIR NORTH-WESTERN NIGERIA

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ABSTRACT

Livestock animals provide meat, milk and hides in all part of the world which play an important role in improving the national economy of Nigeria. Hydatidosis a parasitic diseases caused by *Echinococcus granulosus* tapeworm lead to economic losses due to condemnation of affected carcasses and the necessity to freeze or boil infected meat of these animals. The present study aimed to find the prevalence of hydatidosis in slaughtered animals in Kano city abattoir located in Fagge Local Government Area (LGA). Routine meat inspection of various organs and tissues of 3,449 animals comprising of 1,368 sheep, 1,132 goats and 949 camels showed that 9.68% were infected with hydatid disease. The prevalence of infection with hydatid cysts in camel (14.12%) was higher than that of goat (8.03%) and sheep (7.97%). Of the 2233 males of all the animals examined, 182(8.15%) were infected with hydatid cysts while 152(10.39%) of the 1465 female animals investigated were infected. In all the goat and sheep breeds examined, Yankasa had the highest infection rate. The statistical analysis results obtained revealed significant difference between season, sex and breed in terms of infection ($P>0.05$) as all their P values are less < 0.0001. During the study period 10.45%, 2.99% and 0.75% of lungs, liver and spleen of the slaughtered animals were condemned due to infection with hydatid cysts. Seasonal occurrence of the cysts in the animals revealed a rise of infection during the dry season. Therefore, there is a need to find ways of limiting or eradicating this parasitic disease.

Keywords: Prevalence, Hydatidosis, Hydatid cyst, Camel, Goat, Sheep, Kano

INTRODUCTION

Hydatidosis otherwise known as "Echinococcosis" is an infection caused by the larval stages of cestodes (tapeworm) *Echinococcus* (CDC, 2012). Hydatidosis is among the parasitic diseases that contribute greatly towards causing drastic reduction in livestock animals production. Lightowlers *et al.*, (2000) report hydatidosis as a global animal health problem of increasing importance.

This parasite is found worldwide and causes serious public health problems in certain parts of the world (Shantz, 1990). The metacestode, called as 'hydatid cysts' is found in internal organs mainly liver and lungs of humans and intermediate hosts (herbivore, goats and camels) as uniloculars such as sheep, horses, cattle, pigs although cysts may be found in many other organs (Adebayo, 2016).

Hydatidosis has worldwide distribution and variable geographical incidence (Craig *et al.*, 2003). In Nigeria, Duncan (1961) report one case of human Hydatidosis while Rabi'u and Jegede (2010) reported a high incidence of Hydatidosis in camels slaughtered in Kano (20.5%) which is of great public health risk to consumers of camel meat and its products. While in many parts of the world this disease complex are considered among parasitic infections of major economic significance, their overall prevalence and economic losses due to them in Nigeria is unknown (Rabi'u). The disease has been termed an emerging/reemerging disease (Torgerson *et al.*,

2006). This study therefore seeks to access the prevalence of Hydatidosis among slaughtered animals at Kano abattoir.

MATERIALS AND METHODS

Study Area:

The study was conducted in Kano city abattoir located at Fagge local government area of Kano state ($12^{\circ} 12' N$ $8^{\circ} 30' E$).

Post Mortem Inspection:

The Study was conducted in two phases:

Phase 1: Was conducted for three months during the dry season February – April, 2007

Phase 2: Was conducted for three months during the wet season June – August, 2007. For both seasons, 3,449 slaughtered animals comprising 1,368 sheep, 1,133 goats and 949 camels were examined for hydatid cysts three days in a week. The age, sex, season and breed of the animals were also recorded.

Examination of Hydatid Cysts:

Hydatid cyst was identified according to routine procedures (Rabi'u, 2010). Animals with cysts like lesions on the surface of the lungs, liver and heart and the palpated nodules deeper in the lungs were recorded as suspected hydatid cases. The suspected nodules were examined for the presence or absence of brood capsules and daughter cysts which arise from the parent cysts. 1.5ml syringe was used to aspirate 5mls of the cyst fluid into a centrifuge test tube and centrifuged at 10,000g for 5mins at 4°C.

Treatment of hydatid cyst:

After centrifuging the cyst fluid, a drop of the sediment was transferred to a slide and covered with a covered glass. The preparation was examined microscopically for the presence of evaginated and invaginated protoscolecuses using the 40x objective to identify the hooks of the scolecuses (Ochei and Kolhatkar, 2000).

Assessment of carcasses and organs condemnation due to hydatid cyst:

The number of carcasses and organs of the animals condemned due to infection with hydatid cysts were estimated during the six months period of investigation.

Statistical Analysis:

The data obtained were analyzed using simple percentages and test of significance and independence association was conducted manually, using chi square test (X^2) to check for association or lack of association between the rate of infection in the animals and the season when slaughtered, breed and sex of animals.

Contingency tables and test of independence formula Norman (1994) was used to determine if there is a significant relationship between the seasons, sex of the animals, breed of the animals and the disease.

RESULTS

Of 3,450 animals comprising of 1,368 sheep, 1,133 goats and 949 camels examined for hydatid cysts an overall prevalence rate of 9.68% was obtained. Table 1 summarizes the overall prevalence and seasonal variations of hydatidosis in the different animal species. Hydatid cysts were detected in all species of slaughtered animal investigated. The prevalence rate was found to be 7.97%, 8.03%, 14.12% in sheep, goats and camels respectively. Results on seasonal variations showed a significant difference in prevalence rate between the dry season (11.09%) and the wet season (6.55%) ($p > 0.05$). The prevalence rates obtained during the dry season for the various animals species were 8.69%, 9.25% and 16.69% for sheep, goats and camels respectively. These values were consistently higher than those observed during the wet season for all species as 6.49%, 5.12% and 8.28% for sheep, goats and camels respectively. Overall sex related infection rate of hydatid diseases was 8.15% for males and 10.37% for females (Table 2).

Breed related infection rate was 14.12% for the single camel breed encountered during the study. For goats, 5.12%, 2.39% and 0.53% were obtained for Yankasa, Sahel and African dwarf breeds respectively, a 5.12% (Yankasa), 2.19% (Bulami) and 0.66% (Uda) were recorded for the sheep breeds encountered (Table 3).

TABLE 1: Prevalence of Hydatid Diseases in Food Animal Animal Slaughtered at Kano Abattoir in Relation Relation to Season and Species

Animal species	Total number examined	Total no. infected	% positive	Overall
Sheep (Ovine)	DS 921 WS 447	80 29	8.69 6.49	7.97
Goat (Caprine)	DS 800 WS 332	74 17	9.25 5.12	
Camels (Cameline)	DS 659 WS 290	110 24	16.69 8.28	14.12
Overall	2380	264	11.09	9.68

There is significant difference between the seasons in terms of infection ($P > 0.05$) since the P value is less < 0.0001

Keys: DS = Dry Season, WS = Wet Season

TABLE 2: Sex related infection rate in slaughtered animals at Kano Abattoir With hydatid cysts

Animal Species	Total no. examined	Total no positive	(%) positive	Overall
Camel	M 600 F 348	53 81	5.58 8.54	14.12 134(14.12)
Goat	M 791 F 341	60 31	7.59 9.06	8.03 91(8.03)
Sheep	M 836 F 532	69 40	8.25 7.51	7.97 109(7.97)
Overall	3449	334	9.68	334(9.68)

There is significant difference between the sex in terms of infection ($P > 0.05$) since the P value is less < 0.0001

TABLE 3: Breed related infection rate of hydatid cysts in slaughtered animals of Kano abattoir

Animal species	Animal breed	Number examined	Number positive	Infection breed rate (%)
Camel	Cameline	949	134	14.12
Goat	Yankasa	671	58	5.12
	Sahel	125	27	2.39
	West African Dwarf	336	06	0.53
Sheep	Yankasa	838	70	5.12
	Bulami	386	30	2.19
	Uda	144	09	0.66
Total		3449	334	9.68

There is significant difference between the breeds in terms of infection ($P > 0.05$) since the P value is less < 0.0001

TABLE 4: Condemnation of camels carcasses and organs due to hydatidosis in Kano abattoir

Months	Number of camels infected	NUMBER CONDEMNED (%)			
		Carcass	Lung	Liver	Spleen
Dry season	110	-	12(10.90)	3(2.73)	1(0.91)
Wet season	24	-	2(8.30)	1(0.91)	-
Total	134	-	14(10.45)	4(2.99)	1(0.75)

The cysts were found in Liver, Spleen and Lungs of infected animals. No cysts were seen in the heart. Where cysts occurred in the spleen and/or liver, they were also found in the lungs. The highest rate of infection in a single organ with hydatid cysts was observed in the lung (Fig 1).

Result on condemnation of carcasses and viscera of slaughtered animals for hydatid cysts for the six months investigation period is presented in Table 4. Condemnation findings revealed that no carcass was condemned due to hydatidosis. However 10.45%, 2.99% and 0.75% of lungs, liver and spleen condemnations respectively were condemned.

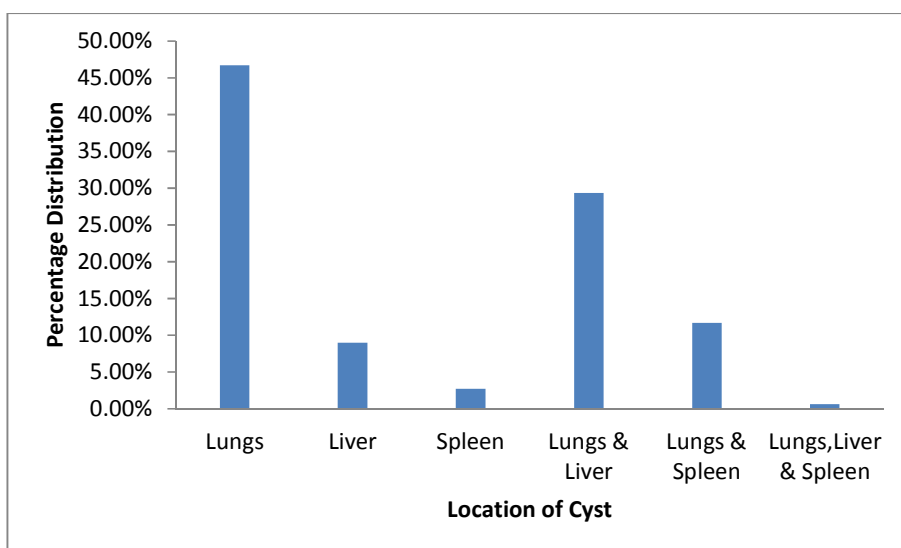


Fig. 1 Distribution of Hydatid cyst on infected slaughtered Animals

DISCUSSION

Among the species of slaughtered animals examined from the Kano abattoir, the incidence of hydatidosis was highest in Camels (14.12%) followed by Goat (8.03%) and Sheep (7.97%) as shown in Table 1. This trend of incidence is similar to the finding of Rabi'u (2010) who reported that the prevalence of hydatid disease was highest in camels and least in sheep. The high rate of hydatidosis in livestock in Kano correlates with previous works reported by Sule (1981), Luka *et al.*, (2009) and Rabi'u (2010).

From the study lungs (10.45%) are seen to be the favored sites for the hydatid cysts since even in multiple infections the lungs are always infected. This explains and supports lungs are always the first organs to be inspected for the presence or absence of hydatid cysts by meat inspectors.

The infection rate of males (8.15%) lower than that of females (10.37%) found may be connected with the generally preferential selection of male animals for slaughter while most females are retained for breeding purposes. Females that live longer are more likely to acquire infection over the years from environment than males that get slaughtered young. The voracious feeding habit of pregnant and lactating females may also be a contributing factor.

The study also shows that for all breeds of goats and sheep, Yankasa (had the highest infection rate. A higher number of Yankasa is slaughtered in the Kano Abattoir than any other breeds. This is may be due to the socio-economic activities of the area where they are raised.

The higher prevalence rate of infection rate recorded during dry season (11.09%) may be related to the life cycle of the parasite and the rainfall pattern in the

state. The eggs (gravid proglottids) which have been laid are ingested by herbivores during grazing of the lush grass that has sprouted as a result of the first rain. The larval form takes months to become fully developed hence the increase in prevalence by the dry season.

The risk to human health apart, (man get infected by eaten the carcass or organ of infected animal) the large number of organs that have to be condemned as a result of hydatid cysts infection necessarily result in the deprivation of people of the much needed protein. The condemnation figures summarized in Table 4 show that as high as 10.45% of lungs and 2.99% of liver from slaughtered animals were condemned during the research work. This translates into a huge economic loss. Theodoropoulos *et al.* (2002) also reported that hydatid cyst were the parasites most contributing to marketable organ condemnation.

CONCLUSION

This study has shown that hydatidosis is prevalent among animals slaughtered in Kano abattoir the dry and wet season's period of the study and assess losses due to the disease.

The dry season, result (8.69%), (9.25%) and (16.69%) obtained for hydatidosis of sheep, goat and camels respectively were considered very reliable.

This view was substantiated by the lower incidence of the disease in food animals for the wet season viz (6.49%), (5.12%) and (8.28%) for hydatidosis of sheep, goat and camels respectively. The data obtained in this study could serve as an update on the status of these parasitic diseases in slaughter animals in Kano.

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