RETROSPECTIVE STUDY OF BOVINE TUBERCULOSIS AT GOMBE METROPOLITAN ABATTOIR, GOMBE STATE, NIGERIA

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ABSTRACT
This retrospective study examines the prevalence of bTB at Gombe Metropolitan Abattoir, Nigeria, over a five-year period (2016-2020). Bovine tuberculosis, caused by Mycobacterium bovis, is a chronic infectious disease with zoonotic potential, necessitating comprehensive monitoring and control measures. The study analyzed data from postmortem examinations conducted on slaughtered cattle, focusing on the presence of typical tuberculosis lesions. Standard meat inspection procedures were employed, involving visual and palpation examinations of organs and lymph nodes. Statistical analysis using Microsoft Excel and SPSS revealed varying annual and monthly prevalence rates of bTB. Findings indicate an overall annual prevalence rate of 0.96%, with fluctuations observed across the study period. Monthly prevalence rates ranged from 0.41% to 1.19%, with no distinct seasonal pattern identified. However, a higher occurrence of bTB was noted during the wet season compared to the dry season. Despite the relatively low prevalence observed, bTB remains a concern due to its potential impact on public health and livestock welfare. Recommendations include enhancing surveillance systems, raising awareness among stakeholders, implementing biosecurity measures, and fostering collaborative research efforts. These measures are essential for effectively managing bTB and mitigating its spread within the livestock population and to humans.
Key words: Retrospective, bovine, tuberculosis, abattoir, *Mycobacterium bovis*

INTRODUCTION

Bovine tuberculosis (bTB) is a chronic infectious and contagious zoonotic disease of domestic animals, wild animals and humans (Radostits *et al*., 2017). It also occurs in a wide range of mammalian species. It is characterized by the formation of granulomas in tissues, especially in the lungs, lymph nodes, liver, intestines and kidney. Tuberculosis is a major health problem with 8–9 million new cases and 3 million deaths annually worldwide (WHO, 2016). The majority of these occur in the developing nations. In Nigeria, there have been limited studies to determine the prevalence or relationship between bovine and human TB, especially with the emerging culture of eating improperly cooked beef and mutton, along with the drinking of unpasteurized fresh milk. Bovine tuberculosis is caused by *Mycobacterium bovis* which is a member of *Mycobacterium tuberculosis* complex (Collins and Grange, 2007). The organism may be transmitted by aerosol or droplets of exudates containing the bacilli. It can be transmitted by ingestion of feed and water contaminated with urine, faecal material or exudates that contain the tubercle bacilli from diseased animals (Raufu and Ameh, 2010). In developing countries, especially Nigeria and particularly the northeastern region, there is paucity of information on the prevalence of bTB and though, it is a notifiable disease in many countries, the lack of effective disease surveillance and disease reporting system and the insidious nature of the disease has contributed to decreased recognition and reporting, leading to a lack of effective and sustainable measures for its control. This study was therefore conducted to determine the prevalence of bTB in Gombe, Northeastern Nigeria.

MATERIALS AND METHODS

This research was carried out in Gombe township abattoir. The study was a retrospective research carried out on bovine tuberculosis (btb) cases recorded in Gombe township abattoir from the year 2016-2020. Consideration were given to slaughtered cattle examined at postmortem and also found with typical tuberculosis lesions. Standard daily Postmortem (PM) examination was employed in the abattoir as routine meat inspection procedures by the assigned meat inspectors (Veterinarians) at the abattoir. The meat inspection procedures employed visual examination and palpation of the lungs, liver, kidneys, lymph nodes of the carcass including the mesenteric lymph nodes and intestines. The monthly prevalence rate of the disease was calculated as the total number of cases of TB detected in a

month divided by the total number of cattle slaughtered that month while the annual prevalence rate was calculated as the total number of bTB detected in a year divided by the total number of cattle slaughtered that year and expressed in percentage. The overall prevalence rate was calculated as the total number of cases detected over the total years under investigation divided by the total number of cattle slaughtered for all the years and presented in percentage. The data retrieved were statistically analyzed using the "Microsoft Excel 2010 (Version 1.0) and SPSS-Version 20.0". The data were also presented using descriptive statistics in the form of table. Chi-square test of association ($\chi 2$) was used to determine possible association between season and disease occurrence in the abattoir, respectively. $P < 0.05$ was considered significant throughout the study.

RESULTS AND DISCUSSION

Table 1: Annual prevalence of a bovine tuberculosis in cattle (2016–2020)

Year	Slaughtered cattle	bTB cases	Annual prevalence (%)	χ^2
2016	5037	45	0.89	57.342
2017	5579	51	0.91	
2018	6435	68	1.06**	
2019	6410	59	0.92	
2020	4209	42	0.99	
Total	27,670	265	0.96	

Out of 27,670 slaughtered heads of cattle examined at postmortem from 2016 to 2018, 265 (0.96%) had tuberculosis lesions. The total annual prevalence rate (0.96%) of bTB recorded in the study varied significantly with the highest in 2018 (1.06%). The overall annual prevalence rate showed intermittent increase in levels above the expected prevalence. The reason for the lower prevalence found in this study may be attributed to high number of cattle slaughtered together with low number of bTB recorded during that particular year. This study was in agreement with the findings of Pfeiffer (2013).

Table 2: Monthly prevalence of bovine tuberculosis in Gombe Township Abattoir (2016–2020)

Months	**Btb cases**	**Slaughtered cattle**	**Prevalence (%)**	χ^2	**P-value**
January	17	2593	0.66	35. 821	0.0001
February	21	2343	0.89		
March	19	2762	0.69		
April	16	2389	0.67		
May	12	1896	0.63		
June	13	2472	0.53		
July	18	2330	0.77		
August	17	1433	1.19		
September	14	1835	0.76		
October	18	2174	0.83		
November	15	2485	0.60		
December	12	2958	0.41		
Total	**192**	**27,670**	**0.69**		

The Table showed the monthly cumulative percentage rates of bTB over the five (5) years period of the study as 0.69%. The overall (2016–2020) prevalence rates of 0.69% obtained in this study for bTB was lower than the previous studies conducted in the same Gombe Town by Adang *et al*. (2015)

Table 3: Seasonal prevalence of bTB in Gombe Township Abattoir (2016–2020)

Season	**Slaughtered cattle**	**bTB cases (%)**	χ^2	***p*-value**
Wet season	13141	1500 (11.41)	25.665	0.0001
Dry season	14529	1100 (7.57)		
Total	27670	2600		

The distribution and occurrence of the disease in rainy season was higher 1500 (11.41%) at the abattoir than that in the dry season of 1100 (7.57%) and there was a statistically significant difference between the two seasons. The pattern of occurrence of the disease also appeared to be more prevalent

in the rainy season than in the dry season in the state capital abattoir as previously reported by Aliyu *et al.* (2019).

CONCLUSION AND RECOMMENDATIONS

The retrospective study conducted at Gombe Metropolitan Abattoir over five years (2016-2020) revealed a consistent but relatively low prevalence of bovine tuberculosis (bTB) among slaughtered cattle. It can therefore be concluded that, there is a need for improved surveillance and monitoring systems for bTB at Gombe Metropolitan Abattoir to accurately track disease trends and implement timely interventions. Public awareness campaigns should be intensified to educate stakeholders, including livestock farmers, abattoir workers, and consumers, about the risks associated with bTB transmission and the importance of proper cooking practices.

REFERENCES

Adang, K.L., Kudi, A.C., and Akpavie, S.O. (2015). Prevalence of bovine tuberculosis at Gombe abattoir. Sokoto Journal of Veterinary Sciences, 13(2), 27-32.

Aliyu, M.M., Abubakar, U.B., and Dauda, A.B. (2019). Epidemiology of bovine tuberculosis at Gombe abattoir, Gombe State, Nigeria. *Journal of Veterinary Medicine and Animal Health*, **11**(3), 67-73.

Collins, C.H., and Grange, J.M. (2007). Zoonotic tuberculosis due to Mycobacterium bovis in developing countries. *Emerging Infectious Diseases,* **13**(6), 699-701.

Pfeiffer, D. (2013). Tuberculosis at the human-animal interface: An emerging zoonosis. Infections in Medicine, **30**(5), 4-9.

Radostits, O.M., Gay, C.C., Hinchcliff, K.W., and Constable, P.D. (2017). Veterinary Medicine: A Textbook of the Diseases of Cattle, Horses, Sheep, Pigs, and Goats (11th ed.). Elsevier Health Sciences.

Raufu, I.A., & Ameh, J.A. (2010). Bovine tuberculosis: A retrospective study at Mokwa abattoir, Niger State, Nigeria. *Sokoto Journal of Veterinary Sciences*, **8**(2), 1-6.

World Health Organization (WHO). (2016). Global tuberculosis report 2016. Geneva: WHO Press.