

Current Status of Bovine Tuberculosis in Ogbomoso Area of Oyo State

¹S.A. Ameen, ¹O.S. Adedeji, ²A.K. Raheem, ²O.O. Leigh, ¹T.A. Rafiu and ¹A.O. Ige

¹Department of Animal Production and Health, LAUTECH, Ogbomoso, Nigeria

²Department Veterinary Surgery and Reproduction, U.I. Ibadan, Nigeria

Abstract: This study investigated Bovine tuberculosis in 17676 cattle slaughtered in “Attenda” abattoir of Ogbomoso area of Oyo state between November 2004 - October 2005. The granulomatous lesions in lung, lymphnode (mediastinal, bronchial retropharyngeal and mesenteric) liver, spleen and intestine were observed in 97 cattle out 17676 and they were positive by Ziehl – Neelsen (acid-fast) technique. There was no significant difference at $P > 0.05$ between percentage status in both dry and rainy season with 0.54% and 0.57% respectively, also in organ and sex distribution in both male and female. Of the 97 tuberculosis lesions found 57 were found in males while 44 occurred in female. The most affected organs were lungs at 49 (48.51%) and lymphnode 26 (25.74%) while the least affected organs were spleen and small intestine 4 (3.96%) and oesophagus and diaphragmatic muscles were not affected at all (0.0%) respectively while. The conclusion drawn was that overall percentage status of 0.55% was observed in cattle slaughtered in Ogbomoso area of Oyo state and this is of epidemiological importance to both human medics, veterinarian and for public health.

Key words: Bovine • Tuberculosis • Granulomatous

INTRODUCTION

Ogbomoso is one of the major town in Oyo State and it lies in longitudes 4°15' East of Greenwich meridian and latitude 8°15' North East of the equator and is about 145km North East ward from Ibadan capital of Oyo State. The altitude between 800-600mm above sea level and the mean annual temperature is about 27°C [1] while that of rainfall is 1247mm although [2] reported 1175mm annual rainfall and the vegetation of the study area is derived savannah [1].

Apart from Robert Koch who discovered the organism causing tuberculosis in 1882 other workers have studied the tuberculosis in recent times [3-8].

The disease is being diagnosed based on clinical and pathological examination with isolation of the tubercle bacilli, [3,9].

The tubercle bacilli were first clarified into Bovine, human and Avian types which later named as *Mycobacterium bovis*, *M. tuberculosis* and *M. avium* respectively. In cattle the disease caused *M. bovis* is characterized by progressive development of tubercles in any of the organ. The identification of the organism causing tuberculosis depend on laborious determination of cultural characteristics and susceptibility to therapeutic agent [9].

All species of all large group livestock, including human are susceptible except horses and sheep which usually show a high natural resistance [9].

In the third world countries there is increase in the incidence of tuberculosis [10] and this is associated with increase in epidemics of human immunodeficiency virus (HIV) infection [11]; Poor control and eradication methods adopted by third world countries, some risk factors such alcoholism, nutritional problems, aged and immunosuppressive drug abuse among others. The incidence of tuberculosis in man has been reduced drastically in advanced countries although with occasional severe outbreak due to eradication and control measures such milk pasteurization and test meta inspection and slaughter policy among others. The epidemiological status of Bovine tuberculosis in some area in Nigeria are thus: 1.3% in cross river state abattoir [12] 2.1% in Maiduguri Abattoir [13], 0.4%, 0.5% and 0.7% in Sokoto abattoirs were reported by [4,6,8] respectively.

In Ogbomoso area of Oyo state, there is dearth of information on the status of Bovine tuberculosis, therefore this study focused on the status of bovine tuberculosis in Ogbomoso area of Oyo state, Nigeria.

MATERIALS AND METHODS

The identification of the suspected tuberculosis cases was based on obvious clinical signs observed before slaughter and thorough post slaughter and thorough post mortar examination of individual animals. The observable clinical signs before slaughtering include gross emaciation, coughing and weakness. By visual examination, incision and palpated specimen of lung, spleen, liver, intestine and lymph nodes of bronchial, mediastinal, retro-pharyngeal and mesenteric with granulomatous tuberculosis lesions were collected from cattle slaughtered at "Atenda abattoir" in Ogbomoso area of Oyo state. Each sample was collected in separate polythene bag labeled and packed in transport flask. These specimens were carried to Department of Animal Production and Health laboratory Ogbomoso of LAUTECH where they were kept at -20°C until processed. Samples were collected Tuesday and Thursday of every week for 12 months (October 2004-September 2005). Each tissue was decontaminated in Sodium hypochlorite solution for 4 hours. Fat was trimmed off and the tissue ground in sterile mortar in glass chamber to reduce spread of the disease and protect the personnel. Phenol red was used as an indicator. The tissue was then treated with equal volume of 2% NaOH for 10 minutes and neutralized with 6N HCl. Finally, the tissue was centrifuged and supernatant decanted. Two smears of the homogenates of each specimen were made and stained by the Ziehl and Neelson (Z-N) method as described by Elmer [14]. Presence of acid-fast bacilli was a suggestive of Bovine tuberculosis infection positive specimen/samples were analyzed for season, organs and sex distribution and differences tested by the SPSS @ 2000 statistical package.

Data Analysis: Data obtained were subjected to student t-test and chi-square test for the establishment of significance [15].

RESULTS

Out of 17676 cattle slaughtered during 12-month study period. Organ from 97 cattle were positive for tuberculosis lesions giving an overall prevalence of 0.55%. This is relatively in between 0.5% and 0.70% in Sokoto abattoirs by Ajogi *et al.* [4], Dusai and Abdullahi [6], Sonfada and Abdullahi [8] and greatly lower than 1.1% reported in Cross River state abattoirs by Bikom and Oboegbulem, [12] and 2.1% reported in Maiduguri abattoir by Anon. [13].

Table 1:

Month	No of animal		Percentage status (%)
	Slaughtered	No positive	
A-Dry season			
1 November	1500	8	0.55
2 December	1622	10	0.62
3 January	1702	7	0.41
4 February	1420	6	0.42
5 March	1508	8	0.53
6 April	1400	10	0.71
Sub Total No	9152	49	3.22
Mean	1525.33	8.17	0.54
B-Rainy Season			
7 May	1462	3	0.21
8 June	1308	8	0.61
9 July	1402	13	0.93
10 August	1408	7	0.50
11 September	1500	9	0.60
12 October	1444	8	0.55
Sub total No	8524	48	3.40
Mean Average	1420.67	8	0.57
Total of all animal	17676	97	0.55

Table 2: Organ distribution of gross lesions of cattle with tuberculosis cases in Ogbomoso area of Oyo state – November 2004- October 2005.

S/No	Organ	Male	Female	Total	% Prevalence
1	Lungs	33	16	49	48.51
2	Lymph nodes	12	14	26	26.80
3	Liver	8	10	18	17.82
4	Spleen	2	2	4	3.96
5	Intestine	2	2	4	3.96
6	Oesophagus	-	-	-	-
7	Diaphragmatic muscle	-	-	-	-
	Total	57	44	97	100%

Table 3: Sex distribution of suspected cattle with Tuberculosis lesions among 97 positive cases in Ogbomoso area (Attenda abattoirs) of Oyo state– November 2004 - October 2005.

Sex	Total no of cattle examined	No with gross lesions	No positive (Z-n) (%)
Male	10606	57 (0.54%)	57 (0.54)
Female	7070	44(0.62%)	40 (0.57)
Total	17676	101	97

The number of Bovine tuberculosis lesions in both dry and rainy seasons were done similar day (n= 49 (0.54%); November-April) and rainy season n=48 (0.55%) May-October and their prevalence rates were similar (Table 1).

The distribution of the lesion in various organs indicated that the lung was the most affected organ followed by lymphnode, liver, spleen, intestine oesophagus and diaphragmatic muscle in that order (Table 2).

Sex distribution of cases is shown in Table 3. There was relatively similar proportion of the cases in both male 0.54% and females 0.57%.

DISCUSSIONS

Bovine tuberculosis is a disease of zoonotic and of public health importance which requires Global attention [9]. The recent upsurge in infection of tuberculosis associated with human immune deficiency virus (HIV) may suggest an increase in bovine tuberculosis in human although about 90% of human population in Africa is exposed to bovine tuberculosis and their products [16,17]. Man to man transmission of tuberculosis is very rare but there are various reports of transmission from man to cattle vice versa [5,7,9].

The prevalence of bovine tuberculosis has been reported in various area in Nigeria, in cross river state abattoirs the prevalence rate of 1.3% [12], 2.1% reported in Maiduguri abattoirs [13], but in Sokoto various and multiple prevalence rate of about 0.4, 0.5 and 0.7% have been reported in cattle slaughtered in Sokoto abattoirs. [4,6,8] respectively. In this report the prevalence rate of 0.55% was obtained in Ogbomoso area of Oyo state which was relatively closed to 0.5% reported in Sokoto abattoir by Ajogi *et al.* [4] but lower than 2.1% reported by Anon. [13] in Maiduguri abattoir and 1.3% reported by Bikom and Oboegbulem, [12].

The distribution of the lesions in various organs indicated that the lung was the most affected followed by lymphnode and liver while spleen and intestine was the least and the oesophagus and diaphragmatic muscles was not affected at all. This indicated that principal mode of transmission in this herd is primarily due to inhalation of aetiological agents rather than ingestion as reported by Radostitis *et al.* [9] and the result from this indicated pulmonary tuberculosis lesion with a prevalence rate of 48.51% (Table 1).

The prevalence rate of both dry and rainy seasons were similar which indicated probably that season has no effect in the rate of transmission. This is quite different from observation of Bikom and Oboegbulem,[12] in Cross river state abattoir who reported that there is a strong association between the occurrence of tuberculosis lesions and seasonal distribution among the 120 cattle affected in the area.

There was no strong association between the occurrence of tuberculosis lesions and sex among the 97 cattle affected, although the number of positive male and female cattle were relatively similar and therefore had no significance difference at $P>0.05$. Even though Bikom and Oboegbulem, [12] reported that the females stay longer in the herd for purpose of reproduction than the male.

CONCLUSION

The results indicated that bovine tuberculosis is prevalent with low status in the area of study but further studies will confirm and establish type and species of mycobacterium causing this lesion because of public health implication of the cases and the role of cattle in the epidemiology of human tuberculosis. Priority should be given to both human and bovine tuberculosis by government and other agencies. The veterinarians, health workers and other researchers should be provided with enabling environment and facilities to detect, diagnose and treat both (man and animals).

REFERENCES

1. Oguntoyinbo, J.S., 1978. Vital statistics in Ogbomoso Community. Day-Bis Limited Ibadan, Nigeria. pp: 2-6.
2. British Tobacco Company (BTC) 2004: Weather report.
3. Pritchard, D.G., 1988. A Century of bovine tuberculosis 1888-1988. Conquest and controversy. J. Com. Path., 99: 357-399.
4. Ajogi, I., U.E. Uko and F.A. Tahir, 1995. A retrospective (1990-1992). Study of tuberculosis, cystercosis and hydatidosis in food animals slaughtered in Sokoto Abattoir, Nigeria. Trop. Vet., 13: 1-4.
5. Cook, A.J.C., 1996. Human and bovine tuberculosis in the Monze district of Zambia- A Cross-sectional study. Brit. Vet., J., 152: 37-45.
6. Dusai, D.H.M. and D.A. Abdullahi, 1994. Current status of bovine tuberculosis at Sokoto abattoir. Trop Vet., 12: 134-137.
7. Michalak, K., C. Austine, S. Diesel, J.M. Balan, P. Zimaerman and J.N. Maslow, 1998. Mycobacterium tuberculosis infection as a zoonotic disease, Transmission between man and elephants. Emerg. Inf. Dis., 4: 56-60.
8. Sonfada, M.I. and H.S. Garba, 2000: A Retrospective study of bovine tuberculosis in cattle slaughtered in Sokoto abattoirs. Sokoto J. Vet Sci., pp: 36-39.
9. Radostitis, O.M., C.C. Gay and D.C. Blood, 1994. Veterinary Medicine: A text book of disease of cattle, sheep, goats, pigs and horses W. B. Saunder (8th ed.) pp: 830-840.
10. Cookson, J.B., 1985. Pulmonary tuberculosis. Tuberculosis series. Postgraduate Doctor Middle East. pp: 70-74.

11. Dolin, P.J., M.C. Raviglione and Z.A. Kochi, 1994. Global tuberculosis incidence and mortality during 1990-2000 Bull W.H.O. 72: 213-220.
12. Bikom, P.M. and S.I. Oboegbulem, 2007. Prevalence of suspected tuberculous lesions in cattle slaughtered in Cross River State Abattoirs, Nig. J. Anim. Prod., 34(2): 301-305.
13. Anon. 1976. Annual Report of the Ministry of Agriculture and Forestry Resources., Northern Nigeria (1976).
14. Elmer, 1992. Colour Atlas and Textbook of Diagnostic Microbiology. 4th Edition J. B.I. Lippincott Company. pp: 713-714.
15. Snedecor, G.W. and W.G. Cochran, 1973. Statistical methods (6th edn).Iowa State University Press Ames Iowa, USA, pp: 543.
16. Kitching, R.P., 1993. Guest Editorial Tuberculosis and AIDS: A deadly combination. Brit. Vet. J., pp: 149.
17. WHO 1994. Zoonotic Tuberculosis *Mycobacterium bovis*. Memorandum from a WHO meeting with the participation of FAO. Bull. WHO. 72: 851-857.