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A SURVEY OF CONTAGIOUS BOVINE PLEURO-PNEUMONIA (CBPP) IN CATTLE SLAUGHTERED AT JOS ABATTOIR, NIGERIA

+ Dastu, A.J. + Gofwan, G.P. , * Sudik, S.D., + Machido, H., + Magaji, S.T., Dafur, B.S. and + Damter, S.A.

+ School of Animal and Basic Sciences, Department of Animal Health Technology, Plateau State
College of Agriculture, Garkawa.

* Department of Animal Science, Federal University Gashua, Yobe State, Nigeria.

- Department of Animal Production, Faculty of Agriculture, University of Jos, Plateau State.

Email: dastuabednego@yahoo.com Phone: 08036849578

ABSTRACT

A survey aimed to estimate prevalence of contagious bovine pleuro-Pneumonia (CBPP) using Ante-mortem (Am), Post-mortem (Pm) and laboratory screening was undertaken at Jos Abattoir in October, 2020. Lung tissue samples were collected according to sex, age and reproductive status from the animals and sent to Mycoplasma Laboratory of National Veterinary Research Institute, Vom and processed for isolation of mycoplasma. It was found that 3 (8.3 %) of the males and 28(43.8%) of females showed clinical manifestation of CBPP at antemortem (AM) while at postmortem (PM) 7(19.4%) of the males and 11 (17.2%) of the females showed gross CBPP lesions with marbled lung tissues/chest fluid. There was no significant difference ($p>0.05$) in clinical manifestation at AM and PM on sex and reproductive status bases. There was a significant difference ($p<0.05$) in clinical manifestation of CBPP at AM and PM on age basis, as animals that aged 23 months showed more clinical manifestation 17(24.6%) than those at 12-22 months 2(6.5%). A total prevalence rate of 35.0% was recorded. The laboratory results show a variation in prevalence rate on sex basis, which was significantly different ($p<0.005$). The female had higher incidence rate 64(100.0 %) than the male animals 36(100. 0%). Many of the animals may be apparently normal but still harbor the CBPP bacteria. The study concluded that CBPP incidence was high in the animals influenced by sex and age and advised that regular testing, isolation and or treatment of suspected cases is key to control and management of the infection.

Key Words: Prevalence, contagious bovine pleuro-Pneumonia, sex, age, reproductive status

INTRODUCTION

Contagious Bovine pleuro-Pneumonia (CBPP) is an infectious and contagious disease of cattle caused by *Mycoplasma sub spp. mycoides* transmitted by close contact between infected cattle and susceptible animal in a share night accommodation, or at water holes, dip tank, markets, common grazing and gathering places during mass vaccination campaigns from people or sacks (FAO, 2021, Mahamadon *et al.*, 2018). CBPP is a disease of high economic importance in the sense that it can compromise food security (Alhaji *et al.*, 2017)). A survey was undertaken in Plateau State by Ankeli *et al.* (2017) on CBPP prevalence revealed that CBPP is still endemic with overall sero-prevalence of 14.39%. Similarly, the prevalence of CBPP in five (5) cattle producing states in the year 2000 in Northern Nigeria was undertaken, a total of 1,936,015 slaughtered cattle were examined for characteristic CBPP lesions and an overall prevalence of 95% was obtained with a total of 279 CBPP outbreaks and an overall vaccination coverage of only 9.7% (Maliyu, 2000). This suggest that more has to be done in the area of vaccination against the disease. Olatunde, *et al.*, 2013, FAO., 2021) reported that pregnant cows and heifers may abort in acute case of CBPP which signifies reproductive status is one of the animal's risk factors. Nma *et al.*, (2020) reported the isolation of *mycoplasma mycoides vari. Mycoides* from foetus of infected dam semen and sheath washings of two bulls is suggestive that reproductive status has effects on prevalence of the disease. Okaiyeto *et al.*, (2013) conducted an on-farm diagnosis on CBPP in cattle in Katsina State and reported an infection rate of 11.8% in adult animals and 19.6% in the calves indicating more of CBPP infection in the young than the adult. FAO, (2019) carried out a Post-mortem on cattle in Gongulung in Borno State and confirmed that they died from CBPP infection which affected cattle of any age.



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Clinical manifestation of the disease include fever, self-isolation from herd, anorexia, difficulty in breathing that is labored and painful (Alhaji et al., 202; OIE, 2021). One of the major reasons why the disease poses a major threat is that, signs of the disease start manifesting several days to month after infection (Alhaji et al., 2020). Another major reason for endemicity of CBPP in Nigeria is ethnic, inter-tribal wars and insurgency in some states which resulted in the displacement of people and their livestock, creating difficulty in mass vaccination and disease surveillance (Yunusa et al., 2020). Post-mortem lesions such as accumulation of yellow fluids, marbled lungs with fluids sticking in the chest wall is one of the factors used for CBPP diagnosis (Anja persson et al., 2000, O.I.E., 2021). The study aimed at using antemortem, postmortem and laboratory screening to determine the presence of *mycoplasma* organisms, prevalence rate and advise on control and management measures.

MATERIALS AND METHODS

The materials used: sterile knife, Polythene bag, adhesive tape, bijoux bottles, broth medium, 20% horse serum, 10% yeast, 0.4% pyruvate, 0.04% ampicillin, flask containing ice were used for the study.

Ageing of Animals: The ageing of animals was done based on dentition methods described by John Popp (2021).

Ante-mortem and post-mortem examination: were performed on animals based on clinical signs (C/S) and gross CBPP lesions observed as described by (FA O, 2021).

Sample Collection: The lung tissues were collected by cutting using a sterilized knife and tight into polythene bag and labeled accordingly using adhesive tape/pen.

Step 2: The lung tissues were processed aseptically by cutting a little piece and dropping directly into bijoux bottle containing 2mls *pleuro-Pneumonia* like organisms (PPLO) broth medium (transport medium) and screwed tight.

Step 3: The lung samples were packed immediately in ice and transported to the *Mycoplasma* laboratory of National Veterinary Research Institute, Vom for processing as described by (Nicholas and Baker, 1998).

Laboratory Examination/Microbial Culture: Lung tissue samples were processed for isolations of *mycoplasma* using standard methods of isolation as described by (Thiacourt et al. (1992) Nicholas and Baker, 1998). Processed samples were incubated until 'fried egg' colonies were observed and results were recorded.

Data Analysis: The data obtained was subjected to statistical analysis using chi-square analysis and descriptive statistics using simple percentage to determine the prevalence rate.

RESULTS AND DISCUSSION

The results reveals that 3 (8.3%) of the males and 28 (43.8%) of the females shows clinical manifestation of CBPP at Ante-mortem (AM) table1, while at Post-mortem (PM) 7 (19.4%) of the males and 11 (17.2%) of the females, table2, had CBPP like gross lesions with marbled lung tissues characterized with yellowish fluids different from normal lung tissue which agrees with the diagnostic procedure of Anja-persson et al. (2000) Fig. 1ab and 2ab. There was no significant difference ($p > 0.05$) in clinical manifestation at ante-mortem and post-mortem on the basis of sex and reproductive status, table 1 and 2. On age basis, clinical manifestation of CBPP at both AM and PM differs significantly ($p < 0.05$) according to age. Table 1 and 2. The laboratory results shows that 7 (19.4%) of the males and 28 (43.8 %) of the females were positive for CBPP indicating more infection in the females than the males, this agrees with the findings of Olatunde et al. (2021) who reported a high prevalence in the females 12 (66.7%) than the males 6 (33.3%). There was a significant difference ($p < 0.05$) in CBPP infection between the male and the female animals, this also agrees with the findings of Gumel, et al, (2015) who carried out a study in cattle in Hadeja Abattoir and reported that infection was highly significant ($p < 0.005$) in the females 4 (8.3%) than the males 1 (1.8%). The study revealed a total prevalence of 35.0%, which is a little higher than the one reported by Ankeli et al, (2017) who carried out a sero-prevalence research on cattle on the Plateau and obtained an overall sero-prevalence of 14.39%. The laboratory screening yielded more positive results than AM and PM examination, the implication is that many of these animals can be apparently normal at AM and PM but still harbors the *mycoplasma* organisms. This also signifies that signs of CBPP starts manifesting long after infection making tracing back difficult as reported by Alhaji et al. (2020).



Table 1: Prevalence of CBPP like clinical sign at Ante-mortem among cattle slaughtered in Jos Abattoir

Variables	No.(%) Examined	No. (%) Positive	No. (%) Negative	Chi- square value	P-value
Sex					
Male	36(100.0)	3(8.3)	33(91.7)	0.174	0.677
Female	64(100.0)	28(43.8)	36(56.2)		
Total	100(100.0)	31(31.0)	69(69.0)		
Pregnancy Status					
Pregnant	1(100.0)	0(0.0)	1(100.0)	0.125	0.724
Not Pregnant	63(100.0)	7(11.0)	56(89.0)		
Total	64(100.0)	7(10.9)	57(89.1)		
Age (Months)					
12 – 22	31(100.0)	0(0.0)	31(100.0)	3.907	0.048
22 and above	69(100.0)	8(11.6)	61(88.4)		
Total	100(100.0)	8(8.0)	92(92.0)		

Table 2: Prevalence of CBPP like gross lesion at post-mortem among cattle slaughtered in Jos Abattoir

Variables	No.(%) Examined	No. (%) Positive	No. (%) Negative	Chi- square value	P-value
Sex					
Male	36(100.0)	7(19.4)	29(82.8)	0.080	0.778
Female	64(100.0)	11(17.2)	53(82.8)		
Total	100(100.0)	18(18.0)	92(92.0)		
Pregnancy Status					
Pregnant	1(100.0)	0(0.0)	1(100.0)	0.211	0.646
Not Pregnant	63(100.0)	11(17.5)	52(82.5)		
Total	64(100.0)	11(17.2)	53(82.8)		
Age (Months)					
12 – 22	31	2(6.5)	29(83.5)	4.597	0.032
22 and above	69	17(24.6)	52(73.4)		
Total	100	19(19.0)	81(81.0)		

Table 3: Prevalence of CBPP like laboratory result among cattle slaughtered in Jos Abattoir

Variables	No.(%) Examined	No. (%) Positive	No. (%) Negative	Chi- square value	P-value
Sex					
Male	36(100.0)	7(19.4)	29(81.6)	5.983	0.014
Female	64(100.0)	28(43.8)	36(52.2)		
Total	100(100.0)	35(35.0)	65(65.0)		
Pregnancy Status					
Pregnant	1(100.0)	0(0.0)	1(100.0)	0.211	0.646
Not Pregnant	63(100.0)	11(17.5)	52(82.5)		
Total	64(100.0)	11(17.5)	53 (82.8)		
Age (Months)					
12 – 22	31(100.0)	2(6.5)	29(93.5)	12.657	0.000
23 and above	69(100.0)	29(42.0)	40(58.0)		
Total	100(100.0)	31(31.0)	69(69.0)		

F. A. O. (2021) reported that cows and heifers may abort in acute cases of CBPP, in this research the prevalent for the Non pregnant cows 11(17.5%) was higher than the pregnant, the reason being that farmers do not take pregnant cows for sale in the market, hence few were selected in the sampled population. On age basis the laboratory results shows that CBPP infection differs significantly ($p < 0.005$) according to age (table3). This does not agree with the findings of Okaiyeto *et al.* (2013) who carried out an on-farm diagnosis of CBPP in Katsina and reported an infection rate of 11.8% in the adult animals and 19.6% in the calves. (Emmanuel *et al.*, 2004, F.A. O., 2019) reported that all ages of cattle are susceptible to CBPP infection, this also agrees with other findings which reported isolation of *Mycoplasma* organisms from fetus and heifers

Conclusion and Recommendation

The study shows a high infection rate due to the presence of *Mycoplasma* organisms in the lung tissue samples and clinical manifestation of CBPP at ante-mortem and post-mortem with total prevalence rate of 35.0%. The laboratory screening methods yielded more positive results compare to the ante-mortem and post-mortem



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examinations. The rate of infection of CBPP was influenced by sex and age, regular yearly vaccination, testing, isolation of suspected cases, treatment, control and or management of the infection is recommended.



Fig. 1a & b. Lung tissue sample with CBPP like gross lesions at post mortem from cattle at slaughter in Jos Abattoir.



Fig. 2a & b. Normal lung tissue sample at post-mortem from cattle at slaughter in Jos Abattoir.

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