

## Clinical management protocol of an acute *contagious bovine pleuropneumonia* in a 6-year-old Bunaji cow in Sakaru village of Soba local government area, Kaduna state, Nigeria

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### Abstract

*The test and slaughter policy of the federal government of Nigeria on contagious bovine pleuropneumonia (CBPP) in cattle is no longer feasible because it lacked the political will as a result, farmers tend to treat their cattle of the disease most which has been ineffective. Therefore, the quest for a supportive clinical management protocol for CBPP in cattle aimed at enabling the cow regain its body condition in order to allow the farmer sell the cow for slaughter at a profit was the aim of this case report. A 6-year-old Bunaji cow weighing 350kg with history of not feeding well, lagging behind during grazing, difficulty in breathing, intermittent cough and bloat was presented. Physical examination was carried out and differential diagnoses which included contagious bovine pleuropneumonia, mango choke, Pasteurellosis and tuberculosis were considered. After a careful scrutiny of the differentials, a tentative diagnosis of contagious bovine pleuropneumonia which was confirmed by the Latex agglutination test (LAT) was arrived at. A supportive clinical management protocol was instituted with the sole aim of enabling the cow regain its body condition in order to allow the farmer sell the cow for slaughter at a profit. The protocol involved isolation of the cow and administration of 20% tetracycline long acting through a combination of conventional (intra-muscular) and non-conventional (intra-venous) routes of administration along with an anti-inflammatory agent and an appetite stimulant. Six days after the commencement of therapy, the observed clinical signs subsided greatly and the cow became apparently healthy. The study showed that, the protocol of administering 20% tetracycline long acting through a combination of conventional (intra-muscular) and non-conventional (intra-venous) routes along with an anti-inflammatory agent (dexamethasone) and an appetite stimulant (vit. B. complex) was effective and profitable to the farmer. The client was advised to sell the cow for slaughter after observing the 21-day withdrawal period of the drugs.*

**Keywords:** Contagious bovine pleuropneumonia, clinical management protocol, Bunaji cow, Sakaru village

### Introduction

Contagious bovine pleuropneumonia (CBPP) also known as lung plague is caused by *Mycoplasma mycoides* subsp. *mycoides* biotype small colony (MmmSC) (Merck Veterinary Manual. 2006; Amanfu, 2009). Contagious bovine

pleuropneumonia is one of the diseases that have OIE officially recognized status (OIE, 2008). The disease was first documented in Nigeria in 1924 (Foluso, 2004), and has since then become endemic in Nigeria (Tambi, *et al.*, 2006; Okaiyeto, *et al.*, 2011) and other African countries (Tambi, *et al.*,

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2006). The disease spreads by contact between infected and healthy animals and presents in multiple forms. As the name suggests, CBPP mainly affects the lungs and the membranes that lined the thoracic cavity (the pleurae) resulting in fever and respiratory distress such as laboured or rapid breathing, moist cough and nasal discharge, exercise intolerance, reluctance to move, stance with neck extended, open mouth with protruding tongue, abducted forelimbs and grunting or groaning. Frothy oral discharge, emaciation, swollen and painful joints (calves) are also observed (ADPR, 2015). About half of the infected animals die within several days to a few weeks of the appearance of clinical signs. During hot weather conditions, the affected animal often isolates itself in the shade with its head lowered and extended, its back slightly arched, and its forelimbs turned out (CFSPH, 2011). In many cases, the disease progresses rapidly, animals lose condition, and breathing becomes very laboured, with a grunt on expiration. About 15% of infected animals die in endemic areas and up to 70 % when introduced into naive herds (ILRI, 2016). In the acute stage, cattle have noticeable respiratory signs, including coughing, nasal discharge, dyspnoea, and polypnoea caused by pneumonia and pleurisy lesions. In the subacute form, cattle have few detectable symptoms and, therefore, pose a significant transmission risk. The infection is spread faster in places where cattle are gathered together, e.g. in housing, transit, communal grazing and watering points etc. The disease reduces incomes through reduced animal productivity, trade restrictions imposed on live cattle by disease free countries, increased costs for veterinary services and death. Cattle movement restrictions, test and slaughter, quarantine and antimicrobials are not an option in Africa (Fernandez and white,

2011). A live vaccine for CBPP exists but its efficacy is hampered by a short and limited duration of immunity (8 months) and requirement of a cold chain for transportation. Although, the recommendation by OIE is test and slaughter. However, in endemic countries which in most cases are low income countries tend to resort to treatment of the infected animal as the easiest only option. In most instances, sulphadimidine and/or tylosin tartrate are the drugs used for the treatment even by the “uneducated farmers”. This practice has resulted in the great abuse of these drugs (Chima, *et al.*, 2001, CSIROpedia, 2011). Most farmers in Nigeria hardly report cases of CBPP but resort to treatment with the above antibiotics that have been greatly abused (Chima, *et al.*, 2001). It was based on this abused that Danbirni, *et al.* (2010) tried another treatment regimen using 20% tetracycline (long acting) in a herd of cattle suffering from CBPP in Kaduna and the outcome seemed to be promising. Therefore, developing a clinical management protocol for the disease in an endemic area which is aimed at reducing losses incurred by the farmer by enabling the affected animal attain a reasonable weight within a short period in order to allow the farmer sell it off for slaughter at a profit is imperative. The management protocol regimen included isolation of the affected animal and administration of a combination of 20% tetracycline and an anti-inflammatory agent along with an appetite stimulant was developed and instituted.

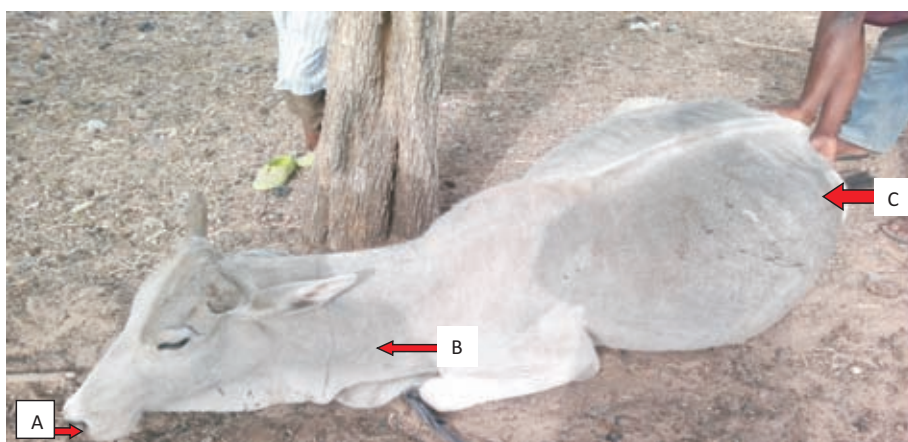
### **Materials and methods**

#### ***History and physical examination***

A team from the ambulatory unit of the Veterinary Teaching Hospital (VTH), A.B.U Zaria were on a routine visit to some herds of cattle in Sakaru village which was about 10 km away from Zaria, along Zaria-

Jos road. The team was presented with a 6-year-old Bunaji cow weighing 350kg from a herd of 27 cattle. The chief complaints were, the cow not feeding well, lagging behind during grazing, difficulty in breathing, intermittent cough and bloat. The cow was reported to have been dewormed a week prior to presentation. During physical examination of the cow, vital parameters were, temperature, 39.8°C; respiratory rate, 33 cpm; pulse rate, 91bpm. The clinical signs observed were, crackles heard on auscultation of the lungs, abduction of the forelimbs, rapid abdominal breathing and reluctance to move and inappetence. Other signs were, bilateral mucopurulent nasal discharges, stretched or extended neck, bloat and prescapular lymphadenitis (Plate I). Blood sample was collected via the jugular vein and was allowed to clot in order to obtain serum. Faecal sample was collected and

taken to the parasitology laboratory of the VTH, A.B.U Zaria for a routine *Coccidia* oocyst and helminths screening. Differential Diagnoses included, CBPP, mango choke and tuberculosis. In order to establish the patency of the oesophagus to rule out mango choke. The cow was drenched with 500mL of water and it was observed to be patent. Pasteurellosis was also ruled out because there was no history of eminent stress. Likewise, tuberculosis was disregarded on the basis that, there are no signs of abduction of forelimbs, extended neck and bloat as well as the crackled sound on auscultation of the lungs in tuberculosis as observed in this case. Therefore, based on the history and clinical signs observed, a tentative diagnosis of CBPP was made. To confirm CBPP, serum obtained, was immediately subjected to Latex agglutination test as described by Okaiyeto, *et al.* (2013).



**Plate 1: Bunaji cow with mucopurulent nasal discharge (A) stretched neck (B) and bloated rumen (C)**

#### **Laboratory result and case management**

Contagious bovine pleuropneumonia was confirmed and a supportive treatment protocol for the management of an acute CBPP was instituted. This included, the isolation of the affected cow, and administration of 20% tetracycline long acting (TLA) at 20mg/kg body weight,

through a combination of conventional (intra-muscular) and non-conventional (intra-venous) routes. Half (3500mg) of the total dose (7000mg) was administered by slow *i.v.* route once, and the remaining half (3500mg) was administered deep intra-muscularly. This was followed by the administration of dexamethasone 0.2mg/kg

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(70mg x3/7) *i.m.* and vitamin B complex 10ml x5/7 *i.m.* The TLA administration was repeated on the 3<sup>rd</sup> day where a total dose of 7000mg was administered via deep *i.m.* only. About 24hrs after commencement of this management protocol, the result of the faecal sample submitted to the parasitology laboratory showed no parasite found. The cow was re-examined on the 10<sup>th</sup> day and was observed to be apparently healthy. The vital parameters were within normal range and the clinical signs had disappeared.

#### **Discussion**

An apparently successful management protocol for an acute CBPP affected cow managed by our team was achieved using a combination of 20% oxytetracycline, dexamethasone and vitamin B. complex injections. Although, the manufacturers of TLA recommended that, it should be administered via deep *i.m.* route. Being an oil base drug, it forms a depo when administered where it is slowly being released. In this case, however, half of the total calculated dose was administered by slow *i.v.* while the remaining was administered intra-muscularly. The *i.v.* route was meant to achieve a faster plasma concentration to immediately combat the circulating Mycoplasma and halt the pathologies that may be caused by them. The TLA was repeated through the conventional route on the 3<sup>rd</sup> day to maintain the plasma concentration of the drug. The associated pathologies in this case, included inflammation of the thoracic plurae. This resulted into pain within the thoracic cavity including part of the vagus nerve that traversed the cavity to innervate the viscera particularly the rumen. This pain in the plurae led to the abduction of the forelimbs in order to reduce the pain and increase the lung capacity. The aforementioned pathologies necessitated the administration of dexamethasone

injection which apart from slowing down the inflammatory process (Holopainen, *et al.*, 2001), has been reported to reduce goblet cell hyperplasia and also block the synthesis of IL-13 (interleukin) all with the aim of reducing mucus secretion to relieve airways obstruction (Janahi, *et al.*, 2017). Also noticed in this case, was bloated rumen due to vagus nerve function impairment on the rumen motility leading to ruminal stasis. The resultant ruminal stasis altered the ruminal microflora balance responsible for the production of the B. complex vitamins. This group of vitamins are instrumental for both energy and protein metabolism which may be of ultimate importance in the recuperation of the cow. For this reason, vitamin B. complex injection was administered. Vitamin B. complex treatment particularly the vitamin B6, has been also reported to have improved motor nerve regeneration and recovery of muscle function (Nedeljkovic, *et al.*, 2016). Hence, its administration substantially assisted in the apparent restoration of the vagus nerve. With this protocol, the animal apparently recovered by day 10 and the body condition improved. Although the ultimate aim of this clinical management was not to eliminate the Mycoplasma sequestered in the lungs, but to resuscitate the cow to an appreciable body condition to enable the farmer sell it off for slaughter with minimal or no economic loss.

#### **Conclusion**

This study showed that, the protocol of administering 20% tetracycline long acting through a combination of conventional (intra-muscular) and non-conventional (intra-venous) routes along with an anti-inflammatory agent (dexamethasone) and an appetite stimulant (vit. B. complex) proved effective and profitable to the farmer. The farmer was strongly advised to sell off the cow for slaughter after the



expiration of 21- day withdrawal period for the drugs. This was to prevent breakage of the sequestered mycoplasma within the lung tissue leading to the release of the bacteria when the cow is stressed up thereby exposing other susceptible animals to the infection. This study recommended that Veterinary Clinician may use this Protocol when managing an acute case of CBPP.

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