

*Case report***Therapeutic management of a cow affected with anaplasmosis complicated with pneumonia***Chowdhury, S., Joy, M. S. H. and Akter, S.**

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ARTICLE INFO*Article history :*

Received : 09/07/2019

Accepted : 19/09/2019

Keywords :

Anaplasmosis, blood smear, haematological analysis, oxytetracycline.

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ABSTRACT

A five-year old cross-breed cow with high temperature, pale mucous membrane and associated clinical symptoms like dyspnea, extended neck, grunting sound of lungs during auscultation, tachycardia with high respiration rate, apparently swollen pre-scapular lymphnode, drooling of saliva and lacrimation was admitted at SAQ Teaching Veterinary Hospital of CVASU. Microscopic examination of the peripheral blood smear revealed numerous *A. marginale* organisms at the margin of the erythrocytes. Low hemoglobin level (5.6 g/dl) with normal PCV (39%) and high erythrocyte count (13.63 million/cumm) $13.63 \times 10^6/\mu\text{l}$ were observed on hematological analysis. The cow was treated with long acting Oxytetracycline @20mg/kg body weight intramuscularly at 48hr interval for 5 doses with hematinics amino acid and vitamin supplement. Clinical sign started to subside within 5 days post treatment and complete recovery was observed within 14 days of post treatment.

To cite this paper : Chowdhury, S., Joy, M. S. H. and Akter, S. 2019. Therapeutic management of a cow affected with anaplasmosis complicated with pneumonia. Bangladesh Journal of Veterinary and Animal Sciences, 7 (2): 80-83

1. INTRODUCTION

Anaplasmosis is considered as one of the most prevailing and frequently occurring rickettsial disease worldwide. This important tick borne disease is responsible for significant economic loss for livestock industry in Bangladesh and worldwide. In ruminants this is caused by intra-erythrocytic protozoa belonging to the family Anaplasmataceae of the order Rickettsiales, genus *Anaplasma*. Bovine anaplasmosis is mainly caused by both *Anaplasma marginale* and *A. centrale*, where the later generally cause mild disease. Although cattle are most susceptible to this disease, other ruminants like buffalo, bison, sheep, goat, African antelopes and wild ruminant can also be infected (Kocan *et al.*, 2003; Rajput *et al.*, 2005). It has a worldwide distribution but endemic in tropical and subtropical countries of the

world (Kocan *et al.*, 2003; Whittier *et al.*, 2005). Transmission usually occurs by tick *Rhipicephalus sanguineus* (*Boophilus microplus*) which is considered to be the main vector (Aubry *et al.*, 2011). Infection with *A. marginale* generally causes anaemia, progressive weakness, loss of weight and jaundice (Munz and Dumbell, 1994). If untreated, extravascular hemolytic anemia and the anemia are presumed to be the cause of death. Infected animal may also suffer from dullness, depression, rapid deterioration of the physical condition, brownish urine, loss of appetite, muscular tremors, constipation and labored breathing etc. (Bram, 1983). A strong correlation has been reported between age of cattle and severity of anaplasmosis. Young calves are more resistant to anaplasmosis than older cattle (Kocan

et al., 2003). The clinical cases of anaplasmosis are common but the fatal clinical cases are seldom reported. The knowledge about the clinical signs of the disease and their management is important for proper diagnosis and treatment. Here, we report an exceptional case of bovine anaplasmosis where we had observed the pneumonic sign in cattle such as extended neck, opened mouth breathing and grunting sound during auscultation which was so much fatal and indicated us towards immediate pneumonia treatment but with the appropriate diagnosis and treatment as bovine anaplasmosis, it gains recovery within 14 days.

2. MATERIALS AND METHODS

Case history

A five years old cross-breed cow weighing approximately 350kg from a local dairy farm located in Raozan Thana of Chattogram District was brought to the Shahedul Alam Quadary Teaching Veterinary Hospital (SAQTVH) with a history of fever, loss of appetite, lacrimation and respiratory distress since last 15 days. The cow was treated before with procaine and benzyl penicillin, such as pheniramine maleate, ketoprofen, dexamethasone, amino acid i/mly preparation and intravenous calcium borogluconate although no apparent improvement was observed.

Clinical examination

Careful physical and gross examination revealed that the cow was having high temperature (105°F), pale mucous membrane, dyspnea, grunting sound during respiration, increased heart rate (96/min at 1st day, 95/min at 2nd day and 90/min at 3rd day) and respiration rate (56/min at 1st day, 56/min at 2nd day, 50/min at 3rd day), swollen prescapular lymphnode, drooling of saliva, lacrimation etc. The condition of the cow was critical and immediate symptomatic treatment was initiated with ceftriaxone, aminophylline and dexamethasone. However the condition of the animal was not improved.

Diagnosis

Blood sample was collected by jugular venipuncture into two vacutainer (with and without EDTA) for blood and serum analysis. Peripheral blood was also collected from ear vein and blood smear was prepared and stained with Giemsa stain to look for any blood protozoa. Hematological examination revealed decreased level of hemoglobin (5.6g/dl of blood) and increased level of total erythrocyte count. The total leukocyte count (TLC- $17.95 \times 10^3 / \mu\text{l}$) (Table 1) and the serum analysis (Table 3) indicated higher calcium level (14.89mg/dl) and lower phosphorus level (2.86mg/dl).

Table 1. Clinical pathological data derived from hematology

Parameters	Result	Normal range
Hemoglobin	5.6 g/dl	8-15g/dl
Packed cell volume (PCV)	39%	24-46%
Erythrocyte Sedimentation Rate (ESR)	0.1	0-3
Total ErythrocyteCount (TEC)	$13.63 \times 10^6 / \mu\text{l}$	$4-12 \times 10^6 / \mu\text{l}$
Total Leukocyte Count (TLC)	$17.95 \times 10^3 / \mu\text{l}$	$5-10 \times 10^3 / \mu\text{l}$

Table 2. Results of the Differential Leukocyte count

Parameters	Result	Normal range
Granulocyte	8	
Neutrophil	12%	15-33%
Eosinophil	7%	0-20%
Lymphocyte	80%	45-75%
Monocyte	4%	0-8%
Basophil	1%	0-2%

On differential leucocyte count,lymphocytosis (80%) was observed where all other blood cell count was found to be normal (Table 2).

Table 3. Serum analysis report

Parameters	Result	Normal range
Calcium	14.89mg/dl	8-11.4mg/dl
Phosphorus	2.86mg/dl	5.5-8mg/dl
Glucose	82.79mg/dl	40-100mg/dl

Microscopic examination of Giemsa stained blood smear (Figure 1) revealed the presence of numerous *A. marginale* organisms at the periphery of the erythrocyte and the blood parameter revealed that the cows had low hemoglobin level (Table 1) which could be the reason of pneumonia complication. Based on physical, microscopic and hematological examination, the cattle was diagnosed as bovine anaplasmosis.

Treatment

The animal was treated with ceftriaxone@10mg/kg body weight and aminophylline @5mg/kg body weight for 3 days. Following confirmatory diagnosis as bovine anaplasmosis, the animal was treated with long acting oxytetracycline @20mg/kg body weight deep i/mly at 48hr interval for 5days. Other supportive therapy like combined B complex and i/mly hematinic mixture (Inj. Hemovit® trade dose 1ml/10kg), amino acid preparation (Inj. Amino-vit-plus vet® trade dose 1ml/10kg), i/mly were also given to the animal.

4. RESULTS AND DISCUSSION

The case was followed up to 14 days post-treatment and clinical signs was reportedly start to subside from the 5th day onward. A complete recovery was observed within 2 weeks. Conventional techniques like thin blood smear apparently showed the presence of *Anaplasma spp.* at the margin of the erythrocytes and suggested a possible *A. marginale* infection (Soulsby, 1982). The case was accompanied by low haemoglobin level (5.6g/dl) as described by Arun kumar and Nagarajan (2013) who found similar scenario in cattle infected with anaplasmosis. However, we have found additional features like low total erythrocyte count (TEC) and total leukocyte count (TLC) which is totally exceptional findings and doesn't support the most of the previous study. A study of Yasini *et al.* (2012) reported that the values of PCV, RBC and Hb decreased soon after the appearance of parasitaemia followed by a slight rise in the amount of these parameters due to reticulocytes started to grow after 8th day post infection to 23days following mature RBC destruction. Therefore our findings of low Hb level, higher ESR, PCV and TEC might be linked to the growth of reticulocytes which normalize the RBC count but due to smaller size of RBC, the hemoglobin level

was found low indicating microcytic hypochromic anemia. One could assume that the cow may have been suffering from continued iron deficiency which results in the microcytic hypochromic anemia. Additional clinical features such as higher respiration rate, extended neck, grunting sound during auscultation justifies the findings. The higher level of serum calcium could be due to the infusion of intravenous calcium administered to the cow for long period before admitting to the hospital. Some researchers reported that calves up to 1 year of age usually showed no clinical illness whereas cattle 1 to 3 years or above may develop acute or fatal form of disease. In treating bovine anaplasmosis, Oxytetracycline and Chlortetracycline are known to be the most effective drugs during early stage of the infection (Campbell and Rew, 2013). During this therapeutic intervention, we found the apparent efficacy of oxytetracycline after 5 days post treatment when added with iron and vitamin supplement.

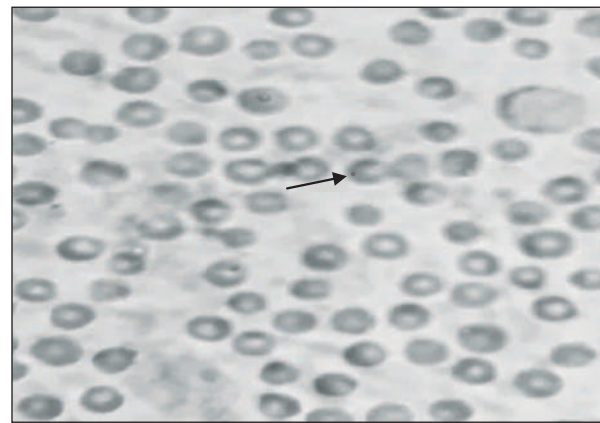


Figure 1. *Anaplasma marginale* (in arrow) in cattle under microscope by Giemsa stain (10x)

5. CONCLUSIONS

The present case study of *A. marginale* infection in a cow presented with severe respiratory distress including dyspnea, grunting sound during auscultation was unique in its nature. This clinical case is expected to help other clinicians to be aware about the distinctive clinical sign of anaplasmosis along with relevant finding at other stages when infection progresses.

6. ACKNOWLEDGEMENT

We acknowledge to the authority of Chattogram Veterinary and Animal Sciences University, Bangladesh for giving opportunity to conduct this study.

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