

Tachycardia due to Colibacillosis in a Calf and its Management

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Abstract

A two-month-old calf was referred to the clinic with watery and foul odour diarrhoea, pyrexia, weakness and dehydration. Microbial examination of dung revealed gram-negative Escherichia coli organisms and was free from parasitic ova. It showed alteration in the haematology and up on electrocardiography tachycardia was noticed. Present case was successfully treated with parenteral gentamicin along with fluid therapy.

Keywords: Calves, ECG, Escherichia coli, gentamicin, tachycardia

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INTRODUCTION

Diarrhoea is one of the most common and multifactorial diseases of neonates chiefly caused by *Escherichia coli* particularly in calves of less than three months of age [1]. Newborn farm animals are highly vulnerable to different infections due to presence of negligible concentrations of circulating immunoglobulins. Diarrhoea causes gastroenteritis, body fluid loss, varying degree of dehydration and various body fluid changes [2]. Colibacillosis is one of the major causes of neonatal calf diarrhoea. Present communication records the cardiac abnormality in a calf suffering with colibacillosis.

CASE HISTORY AND OBSERVATIONS

A two-month-old buffalo calf was referred to the Teaching Veterinary Clinical Complex, College of Veterinary Science, Proddatur, with a history of foul smelling watery diarrhoea and loss of appetite since two days. Up on clinical examination, the calf was depressed, weak in condition with rough hair coat and was unable

to walk properly. The calf showed elevated rectal temperature (102.4°F), increased heart rate (166 bpm) and respiratory rate (42 per minute), severe congestion of conjunctival mucus membranes, sunken eyes, yellow coloured dung with soiled tail and perineum. Dehydration status was observed by skin tenting test and appeared as 6% dehydration (Figure 1). Two-millilitre blood was collected from the jugular vein and was transferred immediately into an EDTA added vial. Blood sample was processed immediately for haematological parameters viz., packed cell volume, haemoglobin, total erythrocyte count, total leukocyte count and differential leukocyte count [3].

The faecal sample was collected directly from rectum and it was processed for both parasitological and microbiological examinations. Swabs collected from the rectum was processed according to the standard procedures like growth in nutrient agar, growth in MacConkey's agar and morphological studies on plates and slides with gram's staining [4, 5]. ECG of the calf

was recorded using base apex lead system in the standing position according to the previous studies with machine speed at 25 mm/sec and a sensitivity of 10 mm equal to 1 mV [6, 7].



Fig. 1: Calf with yellowish watery diarrhoea.

TREATMENT AND DISCUSSION

Haematology revealed increased haemoglobin (13.6 g/dL), total erythrocyte count ($7.4 \times 10^6/\mu\text{L}$), packed cell volume (42 %) and higher total leucocyte count (10420/ μL), neutrophils (42%), eosinophils (3%), lymphocytes (54%), monocytes (1%). ECG findings revealed the heart rate of 166 bpm, mean amplitudes of the P, QRS and T waves were 0.05 mV, 0.60 mV and 0.5 mV, respectively. Mean duration of P, QRS and T waves were 0.06 sec, 0.05 sec, 0.10 sec respectively (Figure 2). Faecal examination did not reveal any parasitic ova. Microbial examination of the dung sample revealed *Escherichia coli* organisms. These organisms had growth on nutrient agar and showed metallic sheath appearance on EMB agar plates (Figure 3).

Calf was treated with injection gentamicin @ 4 mg/kg body weight, BID, IV for five days, along with supportive therapy with fluids which includes normal saline (5% Dextrose and 0.9% DNS) and ringers lactate @ 10 mL/kg body weight, injection dexamethasone @ 0.5 mg/kg body weight, IM, chlorpheniramine maleate @ 0.5 mg/kg body weight, IM for four days and synbiotic bolus @ one boli per day for one week. After two days of therapy, calf was free from watery diarrhoea and complete clinical recovery was noticed after five days of therapy. It attains the normal electrocardiographic records after completion of therapy.

In the present study, increased haemoglobin, packed cell volume and total erythrocyte count was due to haemoconcentration associated with dehydration due to fluid loss. Leucocytosis with neutrophilia and lymphopenia was recorded and the marked neutrophilic response with lymphopenia is characteristic of acute bacterial enteritis. Similar findings in calf diarrhoea have been reported earlier [8]. An electrolytes imbalance in diarrhoeic calves was reported by different researchers as hyponatremia, hyperkalaemia and metabolic acidosis [9].

The electrocardiographic study recorded a short and wide P wave along with peaked T wave, which is indicative of the hyperkalaemia. Hyperkalaemia might be due to increased potassium retention by kidney and also due to cellular damage in the system. In the present study, increased respiratory rate with laboured respiration might be attributed to the decrease of blood pH that stimulated respiratory centres in the medulla oblongata, leading to increase in the depth and rate of respiration to eliminate the excess of carbon dioxide [2]. Cardiac arrhythmias in diarrhoeic calves have been reported to be rare and to occur when hyperkalaemia has developed. Hyperkalaemia was known to induce wave alterations in ECG by causing important changes in the membrane potential and by suppressing sino-atrial and atrio-ventricular conductions [10]. In the previous study also, the author reported the functional second-

degree atrio-ventricular block in a diarrhoeic calf [11].

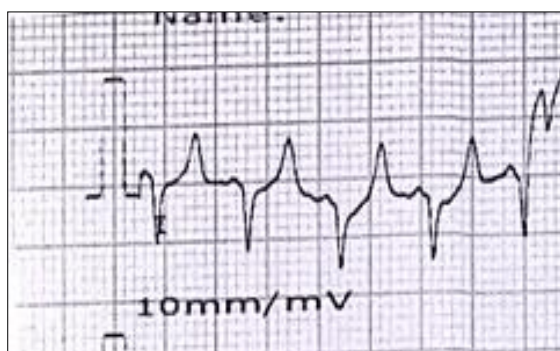


Fig. 2: Electrocardiographic findings suggestive of hyperkaleamia.



Fig. 3: Metallic sheen appearance on EMB agar.

CONCLUSION

The present paper communicates tachycardia associated with colibacillosis in a calf and its successful management.

ACKNOWLEDGEMENT

Authors are thankful to the authorities of Sri Venkateswara Veterinary University for providing the facilities to carry out the present work.

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Cite this Article

B. Sudhakara Reddy, S. Bharathi, T. Nagendra Reddy, S. Sivajothi. Tachycardia due to colibacillosis in a calf and its management. *Research & Reviews: Journal of Veterinary Science and Technology.* 2016; 5(2): 9–11p.