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Clinico-therapeutic management of ketosis in a buffalo: A case report

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Abstract

A five year old Murrah buffalo was presented to Veterinary Clinical Complex of College of Veterinary and Animal Science, Bikaner with the history of parturition before 25 days and had clinical signs of dullness, depression, selective anorexia (refusal to feed on concentrate), drastic reduction in milk yield, head pressing against wall, ketotic odor from urine, breath and milk and rapid loss of body condition. All the clinical parameters such as temperature (100.5°F), respiration rate (16/min) and pulse rate (48/min) were within normal range. The diagnosis of ketosis was confirmed on the basis of history, clinical signs, positive Rothera's test for ketone bodies in urine and by blood glucose level estimation which revealed hypoglycemia in animal. Buffalo was treated successfully with parenteral administration of dextrose, corticosteroid and vitamin B-complex.

Keywords: Buffalo, Ketosis; Rothera's Test.

Introduction

Production diseases are mainly manmade problems, which occupy the most important place among the diseases of dairy animals as it directly or indirectly affect the economy of dairy farm and ultimately leads to huge financial losses to the dairy farmers due to drastic decrease in milk production (Drackley, 1999) ^[1]. Dairy cows and buffaloes are especially prone to production diseases in the last 3 weeks before parturition to 3 weeks after parturition which is also called as a transition period (Radostits *et al.*, 2007) ^[2].

Ketosis is one of the most important production disease of dairy animals occurred due to impaired metabolism of carbohydrate and volatile fatty acids leading to excessive production of ketone bodies *viz.* acetone, acetoacetate and beta-hydroxybutyrate. Ketosis is a multi-factorial disorder of energy metabolism which leads to hypoglycemia, ketonemia and ketonuria (Constable *et al.*, 2017; Priya Waliya 2017) ^[3, 4]. During gestation period increase in the demand of energy due to the foetal growth, lactogenesis and the early lactation is accompanied by a restricted feed intake which puts the animal in negative energy balance (Jorritsma *et al.*, 2003) ^[5]. Excessive negative energy leads to animal more prone to ketosis (Rukkamsuk *et al.*, 1999) ^[6].

Ketosis can be diagnosed by measuring ketone bodies in urine (Rothera's test and keto-Diastix strip test) and milk (Ross test) of animals (Kumar *et al.* 2015; Biswal *et al.* 2016) ^[7, 8] and can be treated with parenteral administration of dextrose, corticosteroids and vitamin B-complex (Chahar *et al.*, 2018; Sandhya Morwal and Shantanu Kumar Kuldeep, 2019) ^[9, 10].

Materials and Methods

Case History

A five year old Murrah Buffalo having history of calving 25 days ago and in first lactation was brought to Veterinary Clinical Complex of College of Veterinary and Animal Science, Bikaner for treatment. Owner gave the history of drastic reduction of milk production (14 liter to 6 liter in last 3 days), refusal to take concentrate, passing off dry mucous coated faces and sweetish smell in the urine and milk of animal and owner also reported that buffalo frequently showed signs of head pressing against the wall, excessive licking of body and other objects last from three days.

Clinical observations

Complete clinical examination of buffalo was made which revealed that animal was dull, depressed, rectal temperature 100.5°F, respiration rate 16/min and pulse rate 48/min and

ruminal movement was 1/min. Buffalo has a typical ketotic odor in the urine, breath and milk. On rectal examination dry, mucous coated and scanty faces were found. Various clinical parameters such as temperature, respiration rate and pulse rate were within normal range which was in agreement with Sahinduran *et al.* (2010)^[11]; Tadesse *et al.* (2012)^[12].

Diagnosis

Urine and blood sample were collected and Rothera's test was carried out for presence of ketone bodies in urine and blood glucose level was also estimated. Urine sample was collected in clean dry glass tube and carried Rothera's test, sample showed purple colour ring after adding rothera's reagent, indicated the presence of ketone bodies in urine (Kumar *et al.* 2015)^[7]. Blood sample was examined for blood glucose level and that was 32 mg/dl (Normal blood glucose level 44mg/dl) which indicates hypoglycemia in buffalo (Radostits *et al.*, 2007)^[2]. The case was nervous form of ketosis according to owner's history, clinical signs and lab diagnosis.

Results and Discussion

As case was diagnosed as nervous form of ketosis, prompt treatment was started with 500 ml of 50% dextrose injection, intravenously, as immediate source of energy and continues for next three days. Dextrose suppresses the NEFA (Non esterified fatty acids) release and hepatic ketogenesis with in few hours of administration. Injection vetalog (Triamcinolone) 5ml intramuscular was injected once only. Triamcinolone is a glucocorticoid and it reduces ketone body formation by utilization of Acetyly CoA and raising blood glucose level by making greater availability of glucose precursor in the liver (Chakrabarti, 2006)^[13]. Corticosteroids have the ability to break down protein in muscles to produce glucose, which immediately replenishes the depressed blood glucose levels, it is important to supply an adequate amount of glucose to prevent excessive breakdown of muscle protein. Injection liver extract with B-complex (Belamyl) 10 ml intramuscularly and injection Tribivet 10 ml intravenously once in a day for three days was given as supportive therapy. Two Rumentas bolus and 100 gm jaggery BD for five days also advised to owner for improving appetite of buffalo. Animal was very well responded to treatment and completely recovered after 3 days of treatment. As the above therapy was in accordance with Upadhyay *et al.* (2007)^[15]; Tufani *et al.* (2011)^[14]; Sandhya Morwal and Shantanu Kumar Kuldeep (2019)^[10]. Dar *et al.* (2014)^[16] also concluded that that glucose administration either parenterally or orally in combination with gluconeogenic precursors fortified with B-complex vitamins, sodium bicarbonate and corticosteroids gave excellent recovery in ketotic animals. Some other coworker's *viz.* Nisbet and Martin (1991)^[17]; Stanislaw and Przemyslaw (2009)^[18] recorded that supplementation of *Saccharomyces cerevisiae* increases serum glucose level and can effective in treatment of ketosis in dairy animals.

Conclusion

Cases of ketosis in animals even at field level can be confirmed by simple Rothera's test. Ketotic buffalo exhibited clinical signs such as selective anorexia (refusal to feed on concentrate), drastic reduction in milk yield, ketotic odor from urine, breath and milk and rapid loss of body condition. Early detection can be helpful in preventing the heavy economic losses to poor farmers by ketosis and quick recovery of the animal.

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