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Dr. Manjunath SP
Department of Animal Husbandry and Veterinary Services, Karnataka, India

Chaitra, Y
Department of Animal Husbandry and Veterinary Services, Karnataka, India

Rashmi R
Department of Veterinary Pharmacology and Toxicology Veterinary College, Bengaluru, Karnataka, India

Corresponding Author:
Dr. Manjunath SP
Department of Animal Husbandry and Veterinary Services, Karnataka, India

Post estrus hypocalcemia in cows

Dr. Manjunath SP, Chaitra Y and Rashmi R

Abstract
Hypocalcemia in cows is commonly seen due to milk fever. It is also seen due to ephemeral fever and parenteral administration of aminoglycosides. In the present study, a rare occurrence of hypocalcemia during the post estrus period is reported. The study was conducted in and around anathi village of Hassan district and dasarigatta village of Tumkur district of Karnataka from 2015 to 2019. In this period, eight cows affected with hypocalcemia on the next day of estrus were treated. The clinical signs and response to calcium borogluconate therapy were similar to those observed in hypocalcemia during the periparturient period due to milk fever. The present study concluded that the probable reason for the development of hypocalcemia during the post estrus period may be due to elevation of blood estrogen level which might have interfered with the mobilization of calcium from calcium reserves to blood leading to hypocalcemia.

Keywords: Hypocalcemia, post estrus, calcium borogluconate, estrogen

Introduction
Hypocalcemia is a metabolic disease, commonly seen in crossbred cows due to milk fever. It is characterized by inability to stand, general muscular weakness, circulatory collapse, depression and loss of consciousness [1]. Apart from this, it has been also reported in cows during ephemeral fever [2], coliform mastitis, and after parenteral administration of aminoglycosides [3]. Hypocalcemia reduces rumen and abomasal motility increasing the risk of abomasal displacement, reduces feed intake, increases the risk of mastitis, reproductive performance, impairs immune function [4, 5]. Several studies have suggested that hypocalcemia is associated with different health problems of the animals but results from different studies are not consistent [6]. Thus, the objective of the current study was aimed to assess the association between the post estrus and the development of hypocalcemia.

Materials and Methods
The study was conducted in and around anathi village of Hassan district and dasarigatta village of Tumkur district of Karnataka from 2015 to 2019. The clinical signs, time of occurrence, hematology and biochemical parameters are evaluated in the affected animals.

Results
During the study period from 2015 to 2019, a total of 158 cattle affected with hypocalcemia were recorded and treated. Among them, 140 cattle showed hypocalcemia in the post parturient period due to milk fever, 10 cattle on the next day of onset of ephemeral fever and 8 cattle on the next day of estrus.

Post estrus hypocalcemia was seen in all age groups of animals and signs were initiated on the next day of estrus. The observed clinical signs followed sequential events similar to hypocalcemia caused due to milk fever. Initially, affected animals were dull, depressed, anorectic, difficulty in defecation and urination, tail in a raised position with straining for defecation, followed by complete cessation of defection and urination. Initially, sternal recumbency with head twisted towards the abdomen, and later lateral recumbency was noticed. Bloat was observed in some cases. In later stages, loss of eye reflexes followed by respiratory distress, regurgitation of ruminal contents through mouth and nostrils were observed. Animals affected with ephemeral fever showed high temperature initially, lameness of one or more limbs followed by a reduction in temperature to subnormal status and also showed similar signs of hypocalcemia as that in milk fever. The hematological parameters in affected animals were in normal range except slight neutrophilia. There was a decrease in serum calcium (4-6mg/dl) and magnesium (4.5 mg/dl).

All the affected animals with hypocalcemia were treated with calcium borogluconate (450 ml per animal i.v.) initially. Based on the response to the treatment and need, another 450 ml of calcium borogluconate was infused. The gel form of calcium was advised for 2 days p.o after milking during night time. On second day of therapy, the animals were again treated with calcium borogluconate i.v. The animals with ephemeral fever were administered with Nimesulide (2-4 mg/kg body weight, i.m) in addition to the above-mentioned treatment regimen. The recovery signs were similar in all the cases of hypocalcemia and occurred in a sequential manner after infusion of calcium borogluconate. There was shivering, normalization of eye reflexes, convulsions followed by defecation, urination and subsequently the treated animal stood up.

Discussion

In the present study, 8 cattle with hypocalcemia on the next day of estrus were observed. The signs and response to treatment were similar to hypocalcemia due to milk fever. The blood calcium level in the affected animals was 4-6 mg/dl indicating hypocalcemia [7, 8, 9]. The post estrus hypocalcemia observed in the present study may be due to excessive obesity, increased blood estrogen level, stress and excitement during the estrus periods which interrupts calcium mobilization from its reservoirs [1, 4, 10]. In addition, deprivation of appetite due to the elevation of blood estrogen levels may also precipitate hypocalcemia.

Table 1: Details of cows treated with hypocalcemia from 2015-2019

Causes of Hypocalcemia	No. of cows affected with hypocalcemia	Clinical signs	Hematological parameters	Biochemical parameters
Milk fever	140	Dull, depressed, recumbency, anorexia, loss of eye reflexes, cessation of defecation and urination with subnormal temperature.	Normal range	Decreased serum calcium level
Ephemeral fever	10	Initially high fever with lameness of one or more limbs. Later subnormal temperature, recumbency, anorexia, loss of eye reflexes, cessation of defecation and urination with subnormal temperature.	Initially neutrophilia, later lymphocytosis	Decreased serum calcium level
Post estrus hypocalcemia	08	Dull, depressed, recumbency, anorexia, loss of eye reflexes, cessation of defecation and urination with subnormal temperature	Neutrophilia with lymphopenia	Decreased level of serum calcium

Fig 1: Cow in lateral Recumbency on next day of estrus

Fig 2: Intravenous administration of calcium Borogluconate

Fig 3: Cow with post estrus hypocalcemia passing dung after infusion of intravenous calcium Borogloconate

Fig 4: Animals with post estrus hypocalcemia after recovery

Conclusion

The present study reported the occurrence of hypocalcemia during the post estrus period in 8 cows and concluded that the rationale for the development of hypocalcemia may be due to elevation of estrogen concentration in the blood which might have interfered with the mobilization of calcium from calcium reservoirs leading to hypocalcemia.

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