

## Case Study

### Successful Clinical Management of Hypokalemic Downer Cow: A Case Report

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#### Abstract

A Jersey crossbred cow had a history of normal appetite, diarrhoea, sternal recumbency, and inability to stand for the previous two days. All physiological parameters were normal throughout the evaluation. The animal attempted to rise but was unable to do so, resulting in sternal recumbency. Serum calcium, phosphorus, potassium, glucose, and sodium were measured in the serum biochemical examination. All serum biochemical values were within normal limits except for low potassium. The animal was given symptomatic treatment as well as potassium chloride (0.4 gm/kg body weight) orally. The animal was helped to stand using a hip sling twice a day. Paddy straw was used to massage the animal's four limbs with hot water. After three days of adequate treatment, the animal was able to get up and recover completely.

**Keywords:** Downer cow, sternal recumbency, hypokalemia, potassium chloride, hip sling

#### Introduction

Downer cow syndrome is a condition in which an animal is active and alert yet unable to stand. It occurs often as a result of hypocalcaemia, hypophosphatemia, and sternal recumbency for more than 24-36 hours, even after two doses of calcium. Downer syndrome can also be caused by a combination of muscle and nerve injuries, prolonged hypocalcaemia, hypokalaemia, hypophosphatemia, myocarditis, hepatitis, and other surgical variables including fracture, bone dislocation, and so on (Raghavendran et al., 2020). The potential contributory factors to the development of clinically significant hypokalaemia in the chronically ketotic cow include reduced potassium intake, intracellular shifting of potassium subsequent to metabolic alkalosis and hyperglycaemia and increased potassium loss from the mineralocorticoid effects of exogenously administered corticosteroid (Peek et al., 1998). Hypokalaemia in cattle usually develop secondary to other conditions such as inappetence, altered renal functions, diarrhoea or iatrogenic alteration of normal electrolyte homeostasis. Rarely does hypokalaemia become so severe that notable weakness or recumbency result (Sielman et al., 1997) Oral potassium administration has been recommended for the treatment of hypokalaemia cows. The recommendations on the amount and application frequency for oral potassium treatment range widely between 60 to 300 gm of potassium per day (Wittek et al., 2019).

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## Case history and observation

A Jersey crossbred dry cow was presented at Teaching Veterinary Clinical Complex, Veterinary College and Research Institute, Namakkal with history of normal appetite, diarrhoea, sternal recumbency and unable to stand (Fig.1). All the physiological parameters were in normal range, such as pink and moist conjunctival mucus membrane, 38.5°C rectal temperature, 80 beats per min. Heart rate, 24 per min. Respiration rate and palpable pre scapular lymph node. However, the animal had tried to get up on its own but not able to stand up. The pinprick test was also carried out in all the four limbs to rule out the limb's sensitivity and nerve functions. The test revealed that the animal was not having any nerve injury. Blood sample was analysed for serum calcium, phosphorus, glucose and potassium level. Serum biochemistry revealed all the values in normal range except serum potassium that was 2.3 mmol/L.

## Diagnosis and treatment

A provisional diagnosis of hypokalemic downer cow was made on the basis of history, clinical examination and serum biochemical findings and treated accordingly. A symptomatic treatment was given by administering injection Normal saline, injection Ringer lactate, injection Enrofloxacin, injection Meloxicam, injection B- complex and injection Meta ways intravenously. Same treatment follows up for three subsequent days with Potassium supplementation orally by rumen infusion pump (fig. 3) (0.4 gm/ kg body weight). After potassium supplementation the animal was put to Hip sling twice in a day and allowed to stand in its support for one hour after standing by hip sling (fig.2). The animal was massaged for all limbs with paddy straw soaked in hot water. As the three days advanced the animal was recovered and stand up by its own without any support (fig.4).



Fig. 1 sternal recumbency (before treatment)



Fig. 2 Animal assisted by Hip sling



Fig. 3 Potassium administration by rumen infusion pump



Fig.4 completely recovered animal

## Discussion

The downer animal responded well to calcium, sodium and potassium supplementation. One of the most common causes of downer is hypocalcaemia. The recumbent downer animal was to be checked for hypophosphatemia and hypokalaemia along with hypocalcaemia. To prevention from the ischemic necrosis, the position of the animal should be changed frequently. This can be done by placing soft bedding material under the animal.

## Conclusion

A downer cow can be successfully treated by early diagnosis and proper treatment. In this case the serum potassium level was low. So, the animal showed good response after potassium administration for three days consecutively. Hip sling will be better lifting devices for alert downer cows. Hence hypokalaemia should also be considered as differential diagnosis while treating the downer cows.

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