

Successful management of haemoglobinuria in a buffalo

Richard Thounaojam, Vivek Joshi*, Nagella Naveen and D. B. Mondal

Division of Medicine, ICAR-Indian Veterinary Research Institute, Izatnagar 243122, Bareilly, Uttar Pradesh

Abstract

Nutritional hemoglobinuria is a disease of high-yielding buffaloes due to hypophosphatemia or cruciferous plant poisoning, causing intravascular haemolysis and haemoglobinuria. A 7-year-old non-descript multiparous buffalo in advanced pregnancy was presented to Referral Veterinary Polyclinic of ICAR-Indian Veterinary Research Institute, Izatnagar with a history of coffee-coloured urine and anorexia for a period of two days. It was reported that buffalo had ingested radish shoots about 7 days earlier. Clinical examination revealed dullness with pale mucus membranes and reduced rumination. Haematobiochemical examination revealed reduced levels of haemoglobin, PCV, marked neutrophilia, hypophosphatemia, elevated BUN and hypoproteinemia. The buffalo was treated with sodium acid phosphate (50 ml IV q12h on 3 occasions), ascorbic acid (5 mg/kg IV q24h for 1-week), vitamin B-complex and iron sorbitol folic acid complex. The buffalo recovered uneventfully following therapy.

Keywords: Buffaloes; Cruciferous plant; Nutritional hemoglobinuria

Introduction

Nutritional hemoglobinuria is a sporadic non-infectious disease of high yielding dairy cattle and buffaloes observed in early lactation (≤ 30 days) and advanced gestation period (≥ 7 months) (Constable *et al.*, 2016). It is frequently attributed to hypophosphatemia or diets containing cruciferous plants like cabbage, rapeseed, sugar beet, turnip or radish (Biswas *et al.*, 2024). Dietary consumption of cruciferous plants like radish (*Raphanus sativus*) induces severe oxidative damage by production of toxic compounds like glucosinolates, thiocyanates, etc. (Kataria *et al.*, 2022; Ruiz *et al.*, 2022). This article present haemoglobinuria in a buffalo following ingestion of radish shoots and its successful management.

Case History and Observation

A 7-year-old non-descript multiparous buffalo in advanced pregnancy was presented to Referral Veterinary Polyclinic of ICAR-Indian Veterinary Research Institute, Izatnagar with complaints of anorexia and excretion of coffee-colored urine (Fig. 1) for a period of two days. It was reported that buffalo had ingested radish shoots about 7 days earlier. Clinical examination revealed dullness, pale mucus membranes (Fig. 2), heart rate of 58 bpm, rectal temperature as 100.8°F and reduced rumination. Blood smear examination did not reveal any haemoprotozoan infection. Haematobiochemical examination revealed reduced haemoglobin, red blood cells, neutrophilia, hypophosphataemia, and hypoproteinaemia.



Fig. 1. Coffee-coloured urine collected from a 7-year-old buffalo in advanced pregnancy

*Corresponding author: joshignet@gmail.com

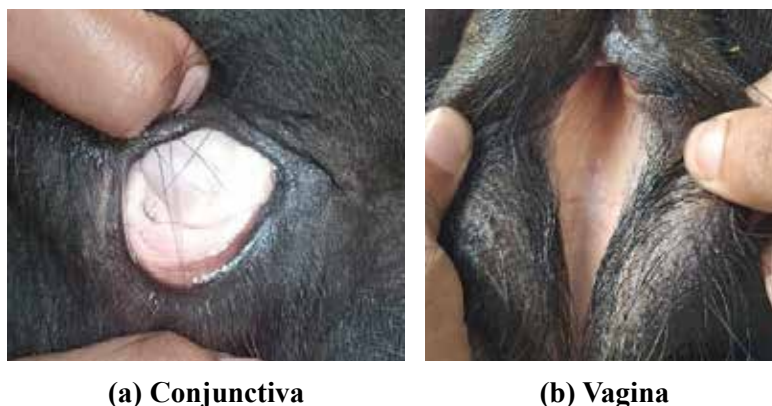


Fig. 2. Pale mucus membranes of a pregnant buffalo with nutritional hemoglobinuria

Treatment and Discussion

The buffalo was treated with sodium acid phosphate (50 ml IV q12h on 3 occasions) and ascorbic acid (5 mg/kg IV q24h for 1-week). The ancillary therapy included administration of vitamin B-complex (10 ml IM q24h) rumenotonic (2 boli PO q24h) for five-days along with iron sorbitol, folic acid and vitamin B₁₂. The buffalo gradually resumed feeding and urine became normal in colour two days post-therapy; however, the complete clinical recovery was observed at the end of one-week long therapy. The buffalo successfully progressed through remaining gestation period and later, delivered a healthy calf.

Reduced Hb, PCV, TEC and phosphorus are associated with intravascular haemolysis and are characteristic findings in parturient haemoglobinuria and dietary hypophosphatemia (Sarma *et al.*, 2014). Neutrophilia (shift to the left) occurs due to stress-induced release of corticosteroids (Rashid *et al.*, 2021). Increased BUN may be attributed to acute kidney injury from Hb precipitation in renal tubules and reduced glomerular filtration rate (Chaudhary *et al.*, 2021). Successful management of haemoglobinuria due to ingestion of radish shoots in buffalo is reported.

Table 1. Haemato-biochemical alterations in buffalo with haemoglobinuria

Parameters	Observation	Reference range
Hb (g/dL)	6.1	8.5-12
PCV (%)	28	33-34
TEC (10 ³ /c.mm)	3.5	5.1-7.6
PLT (10 ³ /c.mm)	204	200-650
TLC (10 ³ /c.mm)	5.1	7-8
Granulocytes (%)	73	21-35
Lymphocytes (%)	23	45-65
Monocytes (%)	4	0-9
SGOT (U/L)	185	78-132
SDH (U/L)	10.4	4.3-15.3
BUN (mg/dL)	32	10-25
Creatinine (mg/dL)	1.62	0.5-2.2
Calcium (mg/dL)	8.94	9-12
Phosphorus (mg/dL)	3.49	5.6-6.5
Albumin (g/dL)	1.93	2.1-3.6
Total protein (g/dL)	4.8	5.7-8.1

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