

Management of Pregnancy Toxaemia Concurrent with Hypocalcemia in a - 4 Year - Old Kano Brown and Sahel Breed Cross Doe

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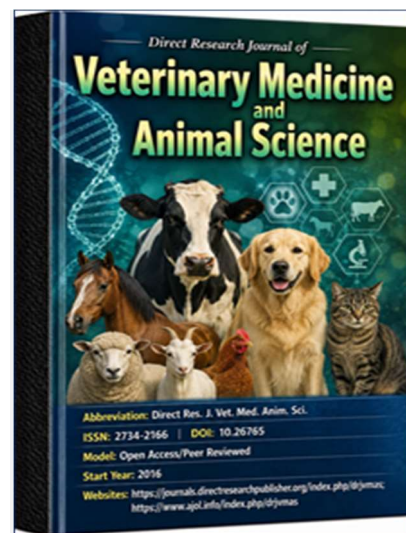
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ABSTRACT

Pregnancy toxemia (twin lamb disease) and concurrent hypocalcemia are critical metabolic disorders of late-gestation small ruminants resulting from negative energy balance and rapid fetal growth. Detailed hematological and biochemical profiles of these conditions in indigenous crossbred goats under semi-intensive management in northern Nigeria remain sparse in literature. A four- year- old Kano brown and Sahel cross pregnant Doe weighing 44 Kg was presented to the large animal Clinic of Bayero University Veterinary Teaching Hospital with the complaint of off-feed and weakness. On clinical examination, the Doe was recumbent and in third Trimester of Pregnancy. There was presence of hyperthermia (39.4°C), tachypnea (38 cycles/min), and tachycardia (93 beats/min). The hematology demonstrated mild anemia (PCV 25.80 %; Hb 8.0 g/dL; RBC $9.70 \times 10^{12} / L$) accompanied by leukocytosis ($13.0 \times 10^9 / L$) with neutrophilia (40.0%), consistent with a stress-related response. Serum biochemistry confirmed subclinical hyperketonemia with elevated beta-hydroxybutyrate (0.9 mmol/L), hypoglycemia (1.80 mmol/L); and moderate hypocalcemia (1.8 mmol/L). Therapeutic interventions given were: inj. Penicillin streptomycin 2ml x 2/7 IM, Inj Multivitamin 4ml x 2/7 IM, inj. Slow Calcium gluconate 20 ml x 3/7 IV. The Doe kidded a day after the medications and was presented for follow up. Inj. 50% Glucose (20ml IV and 30ml SC); and Inj. Diclofenac sodium 2ml x 2/7 IM. The vital parameters progressively normalized from Days 4 to 6, with complete clinical recovery by Day 7. This report highlights the clinical synergistic effect between subclinical pregnancy toxemia and acute hypocalcemia in late-gestation indigenous goats. Early diagnostic recognition, prompt calcium replacement, glucose supplementation, and the alleviation of fetal metabolic burden via kidding are pivotal to favorable prognosis before irreversible neurological injury occurs.

Keyword: Breed, Doe, Hypocalcemia, Ketosis, Kano brown and Sahel breed cross, Pregnancy toxemia



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INTRODUCTION

Pregnancy toxemia is also known as twin lamb disease, a metabolic disorder of pregnant small ruminants caused by an abnormal metabolism of carbohydrates and fats, which occurs at the final stage or few days after pregnancy (Brozos *et al.*, 2011). Early clinical signs of pregnancy toxemia in ewes and does include inappetence, listlessness, aimless walking, muscle twitching, fine muscle tremor, opisthotonos, and grinding of teeth. As the condition progresses, blindness, ataxia and finally recumbency, coma and death will occur in animals that are not diagnosed and treated with the condition (Kahn and Line 2005; Abba *et al.*, 2015). The condition arises from an energy imbalance caused by increased demands for fetal growth and inadequate nutritional intake (Radostits *et al.*, 2007). Pregnancy toxemia can be divided into four categories: (a) The first category is primary pregnancy toxemia where inadequate nutrition such as poor-quality feed or period of fasting that occurs in a doe. (b) The second category is fat doe pregnancy toxemia which is due to over-conditioned during early gestation then the animal suffers a nutritional decline during late gestation. (c) Third is severely under-conditioned does due to lack of feed after drought or after heavy flood. (d) Lastly is secondary pregnancy toxemia due to concurrent disease such as parasites, poor dentition, or lameness. Hypocalcaemia is commonly defined as total serum calcium below 2 mmol/L, and parturient paresis in ewes is sometimes complicated by concurrent pregnancy toxemia (George, 2022). They can be diagnosed in a laboratory by measuring the level of serum betahydroxybutyrate (BHB), glucose, calcium, and potassium while urine ketone level can be checked to further diagnose pregnancy toxemia (Ramin *et al.* 2007). The main objective of treatments in pregnancy toxemia is to increase the formation of glucose for utilization at tissue level, and increase the usage of ketone bodies to prevent acidosis and electrolytes disorder (Cal-Pereyra *et al.*, 2015). However, treatments with drugs are only effective in an early disease diagnosis where prognosis is always grave if the animals start showing irreversible neurological injuries (Cal-Pereyra *et al.*, 2015). Oral replacement of glucose with 30 to 60 mL of propylene glycol twice a day as glucose precursor also must be given (Andrews 1997; Pugh 2002). Reports on pregnancy toxemia in the Kano brown and Sahel cross pregnant Doe in northern Nigeria, with accompanying haematological, serum betahydroxybutyrate (BHB), glucose and calcium data, are scarce. This report describes the clinical findings, laboratory results and field management of a four-year-old Kano brown and Sahel cross pregnant Doe under semi-intensive management.

Case Presentation

Case history

A four-year-old Pregnant Doe weighing 44Kg was

presented to the large animal Clinic of Bayero University Veterinary Teaching Hospital with the complaint of being off-feed, weak and, could not walk. On clinical examination, the Doe was recumbent, weak, lethargic and in third Trimester of Pregnancy. The temperature, pulse and respiratory rate were 39.4 °C, 38 cycle/min and, 93 beats/min respectively.

Laboratory examination

Blood sample from the Doe was collected via the jugular vein into plain and EDTA containers before the treatment begins. The sample was sent to laboratory for hematology and serum biochemistry.

Clinical manifestation

On clinical examination, the Doe was recumbent, weak, lethargic and in third Trimester of Pregnancy. The temperature, pulse and respiratory rate were 39.4°C, 38 cycle/min and, 93 beats/min respectively (Plate I).



Plate I: The Doe was recumbent on the day of presentation (A); assisted to stand up (B).

Case Management

The Doe receives Inj. Penicillin streptomycin 2ml IM x 2/7; Inj. Multivitamin 4ml IM x 2/7, Calcium gluconate 20 ml IV x 3/7. During follow up, the Doe had delivered a kid on the next day. Inj. 50% Glucose was administered (20ml IV and 30ml SC), Inj. Diclofenac sodium 2ml IM x 2/ were given, On day 4, 5, 6 and 7, the vitals were decreasing towards normal. The Doe fully recovered on seventh day (Plate II B).

RESULTS AND DISCUSSION

Pregnancy toxemia is a metabolic disorder with recumbency typically appearing late in the progression from inappetence and listlessness (Kahn and Line, 2005; Abba *et al.*, 2015). The haematological changes observed



Plate II: The Doe kidded on day 2 (A); the white arrow indicating the kid; the Doe was on her feet on day 7 (B)

Table 1: Haematology and Serum Biochemistry of the Doe.

Parameter	Value obtained	Reference
PCV (%)	25.80	26.87±0.51
Hb (g/dl)	8.0	8.96±0.18
White Cell Count ($\times 10^9/L$)	13.0	8.7 - 11.2
RBC ($\times 10^{12}/L$)	9.70	10.90 $\pm$ 2.10
Neutrophils (%)	40.0	33.4 - 36.3
Eosinophils (%)	0.1	3.90 $\pm$ 1.50
Basophils (%)	1.8	7.40 $\pm$ 1.70
Lymphocytes (%)	57.0	51.60 $\pm$ 3.00
Calcium (mmol/L)	1.8	2.0 - 2.8
Betahydroxybutyrate - BHB (mmol/L)	0.9	< 0.6
Glucose (mmol/L)	1.80	2.52

Source: Tambuwal *et al.* (2002); Njidda *et al.* (2013); Sam *et al.* (2019)

in this case were mild. A slightly low PCV, Hb and RBC count suggest mild anaemia, which may reflect poor nutrition or parasitism and this agrees with Edmondson *et al.* (2012). The leukocytosis with neutrophilia, eosinopenia and basopenia in this case is consistent with a stress-related response in a sick, recumbent animal, in which corticosteroid release classically produces neutrophilia and eosinopenia (eClinPath. 2026). The lymphocytosis does not fit the classic corticosteroid pattern, which includes lymphopenia. It more closely resembles the “physiologic” pattern attributed to splenic release of lymphocytes (eClinPath. 2026) which predominates in ruminant blood. The blood picture is therefore best described as a stress-related response. A concurrent bacterial infection cannot be ruled out by looking at the rectal temperature and the differential count, which justifies the penicillin-streptomycin used. The BHB is a

more reliable indicator of disease severity than blood glucose, and glucose here was only slightly reduced, so the energy deficit may have been moderate (George, 2022). The BHB obtained in this case is above the reference limit used in (Table 1) and it therefore indicates subclinical condition of pregnancy toxemia (George, 2022). The recumbent ewe with that value is therefore less ketotic. Hypocalcaemia is also common in pregnancy toxemia, and should be considered in any recumbent late-gestation sheep or goat (Jessica and Angel, 2025). The recorded hypocalcemia is therefore a frequent concurrent finding in pregnancy toxemia. Depressed calcium levels exacerbate muscle weakness and contribute directly to recumbency by impairing neuromuscular function and ruminal motility (Tharwat *et al.*, 2025). The marked hypocalcaemia also contributed to the weakness and recumbency. Rapid response to

calcium administration contributed to the improvement of the ewe during the three days of calcium gluconate therapy and this agrees with report of (Jessica and Angel, 2025) that rapid response can confirm hypocalcaemia. The calcium gluconate corrected the hypocalcaemia and the multivitamin gave metabolic support. This case is therefore a combined pregnancy toxemia and hypocalcaemia rather than toxemia alone. Kidding on day 2 was probably the turning point, because expelling the fetus removes the main drain on maternal glucose. Diclofenac given has anti-inflammatory and analgesic properties with gastrointestinal and renal side effects. It has been reported by Abd Elazem and Abo-Kora, (2015) that it alters haematological and biochemical parameters in goats. NSAIDs should therefore be used cautiously in dehydrated or metabolically compromised animals. The full recovery by day 7 therefore suggests this ewe was treated before such damage occurred, and it shows significance of early case presentation. Prevention rests on managing body condition and late-gestation nutrition, especially in does carrying multiple fetuses and in animals that are over- or under-conditioned (Edmondson *et al.*, 2012; Tinkler, 2014). Under semi-intensive systems in northern Nigeria, attention to feed quality and supplementation in the last trimester is very important. Finally, this report provides valuable regional baseline data. Distinctive Hematological / Stress response and reported concurrent metabolic complications in the Kano brown and Sahel cross in pregnancy toxemia and hypocalcemia. The limitations of this case report are the use of reference values taken from other studies. Faecal examination was not performed to check for the presence of parasites that may contribute to the anaemia seen in this case.

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