

# CLINICAL AND SEROBIOCHEMICAL STUDIES ON PREGNANCY TOXAEMIA IN DOES

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## Abstract

Pregnancy toxemia caused by negative energy balance in late gestation is characterized by hypoglycaemia, ketonaemia, metabolic acidosis and a very high mortality rate. Six pregnant does of 3 to 5 years old, 30 to 40 Kg body weight and 120 to 130 days of gestation were referred with a history of having staggering gait and anorexia. The values of blood glucose, sodium, potassium, calcium, magnesium, total protein, albumin and cholesterol were significantly lower and the values of ALP and AST were higher than the healthy pregnant goats. The animals were treated parenterally with 50% Dextrose solution and B Complex. Calcium glutamate, soda bicarbonate and glycerin were given orally and the animals recovered uneventfully on the next day of the treatment. Four does delivered 3 kids and two does delivered 2 kids normally without any complications after two to three weeks of treatment.

**Key Words:** Pregnancy toxemia – Clinical observation – Serobiochemical changes - Does.

## INTRODUCTION

Pregnancy toxemia (ketosis, hepatic lipidosis) is a metabolic disorder of pregnant does and ewes characterized by hypoglycemia and hyperketonemia resulting from incapacity of the animal to maintain adequate energy balance, which causes significant economic losses due to maternal and fetal death. (Lima *et al.*, 2012). Pregnancy toxemia frequently develops during the last 4 to 6 weeks of gestation primarily in pregnancies with more than one fetus (Rook, 2000). The present study was carried out to study the clinical and serobiochemical changes of pregnancy toxemia in does and its therapeutic management under field conditions.

## MATERIALS AND METHODS

Six cross breed pregnant does of 3-5 years old, 30-40 Kg body weight and 120-130 days of gestation were referred with a history of having staggering gait and anorexia were utilized for the study. Clinical examination of the animals revealed that the animals showed pale mucous membrane, dullness, drowsiness, ruminal stasis, grinding of the teeth, acetone odor from the mouth, dyspnoea, general weakness, stiffness of the body and nervous signs such as abnormal posture, star gazing position and staggering gait. Biochemical examinations of the blood of the affected does were carried out and the

results were compared with the values obtained from six healthy pregnant does. The values of glucose, sodium, potassium, calcium, magnesium, total protein, albumin and cholesterol were significantly lower and the values of ALP and AST were higher in the affected goats than the values of healthy pregnant does (Table). Based on the history, clinical and biochemical observations the cases were diagnosed as pregnancy toxemia.

All the affected animals were given 50 ml of 50% Dextrose solution i/v, followed by 500 ml of 5% dextrose solution i/v, 3ml of B Complex i/m, 25 ml of Calcium Glutamate and 20 gm of Soda bicarbonate orally. 100 ml of glycerine was mixed with 100 ml of water and administered orally and the animals were allowed to drink water on their own.

## RESULTS AND DISCUSSIONS

All the affected animals showed very good response on the day of treatment and became more alert and started to eat and drink on their own on the next day of the treatment. The owners were advised to include high quality roughage and to increase grains in concentrate feed mixture for the recovered does and other does in their farms during last 4-6 weeks of gestation. It was reported that four does delivered 3 kids and two does delivered 2 kids normally without any complications after two to three weeks of

treatment.

Pregnancy toxemia is the result of a large glucose demand of multiple fetuses in last 6 weeks of gestation in small ruminants because approximately 80% of the foetal growth occurs during this period. Fat does and does carrying twins and triplets are at greater risk ( Lima *et al.*, *loc.cit*). Does bearing twins have a 180% higher energy requirement and does carrying triplets have a 240% greater energy requirement than those with just a single fetus. Multiple fetuses, poor quality of ingested energy, dietary energy level, environment, genetic factors, obesity, lack of good body condition or high parasite load and lack of exercise are the predisposing factors for pregnancy toxaemia in does.

During late gestation, the abdominal space is filled with accumulated fat and an ever expanding uterus. Because of the lack of rumen space, these females have difficulty in consuming enough feedstuff to satisfy their energy requirements. Clinical cases are typically limited to older goats and during their second or subsequent pregnancies (Rook *loc.cit*). If the fetal demand and the mother supply become imbalanced due to fasting of the mother or the increased nutritional demands of the rapidly developing fetal placental unit, females suffer from negative energy balance and resulting in pronounced hypoglycemia, ketosis of varying intensity and metabolic acidosis (Lima *et al.*, *loc.cit*). If does do not receive at least half of the required energy during this period, fat depots are mobilized in large quantities (Firat and O' zpinar, 2002).

Ketones are toxic byproducts of excessive breakdown of body fat to compensate for the negative energy condition (Moghaddam and Hassanpour, 2008). The elevated ketone bodies inhibit the hepatic gluconeogenesis, and thus further increase maternal hypoglycaemia (Schlumbohm and Harmeyer, 2004). Keto acidosis is also common during toxaemia. In the present study 20 gms of soda bicarbonate was given orally to each affected animal in order to prevent acidosis and the does were given plain water to drink in order to excrete the ketone byproducts through kidneys.

Goats suffering from pregnancy toxemia become anorexic, depressed, grind their teeth and have acetone smell to their breath. As the disease progresses, the neurological systems become compromised due to lack of glucose. Neurologic signs include blindness, circling, in-coordination, star gazing, tremors, staggering gait, ataxia are seen

and eventually the doe becomes comatose (Al-Qudah, 2011). At this stage the fetuses succumb and release toxins that send the doe into endotoxic shock and dean can occur if the case is left untreated (Bani Ismail, 2008).

In the present study, the diagnosis of pregnancy toxaemia was achieved from the history, by clinical examination and was confirmed by blood analysis. Hypoglycemia and hyperketonemia are more common obvious biochemical features (Hefnawy *et al.*, 2011). The blood level of glucose in pregnant goats with pregnant toxaemia can be a good indicator of the viability of the fetuses. Blood levels of glucose in affected animals varied dramatically and this give rise to the idea that hypoglycaemia might indicate that the fetuses are alive and hyperglycemia that the fetuses are dead (Lima *et al.* *loc.cit*). The marked drop in serum total protein, albumin and cholesterol with significant increase in AST and ALT could throw some light on the hepatic origin of pregnancy toxemia which may be attributed to fat mobilization (Radostits *et al.*, 2007) that associated with inadequate dietary intake (Ramin, *et.al.*, 2005) or due to hepatic damage (Hefnawy *et al.*, *loc.cit*) or hepatic lipidosis (Smith and Sheramn, 2009).

Significant decrease in the serum levels of sodium, potassium, magnesium and calcium in the pregnancy toxemic goats indicated that there were disturbances in the electrolytes and some minerals which may be attributed to stress of starvation, dehydration and involvement of the kidney in the pathogenesis of caprine pregnancy toxemia or also due to enhanced lipolysis that can induce hypomagnesemia and hypocalcemia (Sakha, *et.al.*, 2013). Hypokalemia and hypocalcaemia that are associated with pregnancy toxemia may be attributed to anorexia and metabolic acidosis respectively, which are often associated with pregnancy toxemia (Smith and Sheramn, *loc.cit*).

**Table1** Biochemical parameters (mean±sd) In pregnancy toxaemic does

Parameters	Healthy goats	Pregnancy toxaemic does
Glucose (mg/dL)	117.50 ± 5.20	36.50 ± 1.73
Total protein (g/dL)	6.87 ± 0.18	4.03 ± 0.21
Albumin (g/dL)	3.78 ± 0.13	2.28 ± 0.15
Cholesterol (mg/dL)	102.50 ± 5.64	48.33 ± 2.52
Sodium (mEq/L)	142.00 ± 2.13	114.67 ± 2.13
Potassium (mg/dL)	4.67 ± 0.22	3.07 ± 0.11
Calcium (mg/dL)	10.30 ± 0.32	8.13 ± 0.11
Magnesium (mg/dL)	2.48 ± 0.11	1.52 ± 0.12
ALT(U/L)	29.33 ± 3.29	77.00 ± 5.60
AST(U/L)	111.50 ± 10.50	269.33 ± 5.00

The key to treating toxemia is catching the subtle symptoms promptly. First concern is to hydrate the

does and get enough sugars to the brain to get if functioning properly. Common treatment for pregnancy toxemia include the oral administration of glycerol or propylene glycol solutions, intravenous glucose and, at more than 135 days of gestation, injection of dexamethasone or beta methasone to induce parturition (Radostits *et al.*, *loc.cit*) with the aim of eliminating the metabolic demand for energy, of the gravid uterus. Even with surgery and fluids, prognosis is poor for the survival of both the doe and kids and prevention is of key importance to reduce the occurrence of the disease. Feeding 0.5-1 kg of grain daily along with high quality hay during the last 4-6 weeks of pregnancy and exercise will help prevent pregnancy toxemia (Crnkic and Hodzic, 2012). In the present study early diagnosis and conscientious treatment saved the goats and they delivered the kids naturally without any complications. The owners were also advised to adopt suitable feeding practices for the goats in order to prevent pregnancy toxemia in their goats.

## CONCLUSION

Pregnancy toxemia in 6 pregnant does of 3 to 5 years old, 30 to 40 Kg body weight and 120 to 130 days of gestation were referred with a history of having staggering gait and anorexia. The values of blood glucose, sodium, potassium, calcium, magnesium, total protein, albumin and cholesterol were significantly lower and the values of ALP and AST were higher than the healthy pregnant goats. The animals were successfully treated with intravenous administration of 50% Dextrose solution and oral administration of calcium glutamate, soda bicarbonate and glycerin. Four does delivered 3 kids and two does delivered 2 kids normally without any complications after two to three weeks of treatment. Suitable feeding practices for pregnant does were advised to prevent pregnancy toxemia.

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