

## BIOCHEMICAL AND HORMONAL PROFILES IN BUFFALOES WITH RETAINED FETAL MEMBRANES

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### ABSTRACT

The present study was designed to investigate the incidence of retention of fetal membranes (RFM) on 605 buffaloes at 2<sup>nd</sup> to 5<sup>th</sup> calving with normal calving, premature birth and abortion. The normally calved buffaloes with retention of fetal membranes (after 12 h) were randomly classified in treatment (n = 6) and control (n = 6) groups. The buffaloes in treatment group were administered Dinoprost (PGF<sub>2</sub> $\alpha$  analogue, 25 mg); Meloxicam (anti-inflammatory drug 0.5 mg/kg body weight,); Oxytetracycline (Broad spectrum antibiotics, 5 mg/kg body weight) intramuscularly and intravenous calcium therapy (Calcium gluconate, 1.86% w/v; Magnesium hypophosphite, 5% w/v; Dextrose anhydrous, 20% w/v; Chlorocresol 0.1% w/v, 450 ml) after 12 after calving. The incidence of retention of fetal membranes in buffaloes was 9.98 %, 34.61% and 46.87% in normal calving, premature birth and abortion, respectively. The overall incidence of RFM was 14.04%. There was significant rise in the level of calcium (P<0.01), phosphorus (P<0.05) and magnesium (P<0.05) on day 30 and

day 45 in treatment than control group. However, there was no significant difference observed in level of glucose, NEFA and progesterone between treatment and control group on day 0, 30 and 45. RFM is considered as one of the major problem with higher incidence in premature birth and abortions by ultimately affecting the reproductive efficiency in buffaloes.

**Keywords:** *Bubalus bubalis*, buffaloes, biochemical, fetal membrane retention, hormone, incidence

### INTRODUCTION

Buffaloes are high producing animals (Khan *et al.*, 2004) and are considered “Black Diamond” as contributing more than half of the total milk production in India. Various reproductive disorders creating hindrance in the exploitation of its production potential and thus poor reproductive efficiency remained a major economic concern in terms of reduced fertility, low life time production, longer calving interval and

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increased medication costs in farm animals (Samad *et al.*, 1987). Retained fetal membranes (RFM) in buffaloes constitutes one of the major postpartum complications leading to severe endometritis, metritis, pyometra, perimetritis, ovaritis (Roberts, 1971), cystitis and peritonitis (Wetherill, 1965) and vaginal prolapse (Odegard, 1977) prone to drastic milk reduction and poor female fertility (Laven and Peters, 1996) characterized by prolonged calving intervals (Joosten *et al.*, 1988) and repeat breeding (Narsiinhan and Deopurkar, 1994). The role of certain biochemical constituent's glucose, serum total protein and macro-minerals in various reproductive processes have been well documented (Quayame *et al.*, 1985) in buffaloes. Disturbance of endocrine function, high progesterone and cortisol and low estradiol levels were traced in blood of animals with RFM (Michal *et al.*, 2006). Therefore, the present research work was designed to study the incidence of retention of fetal membranes in buffalo with normal parturition, premature birth and abortion and its association with biochemical and hormone profiles.

## MATERIALS AND METHODS

The study was conducted on 605 buffaloes at 2<sup>nd</sup> to 5<sup>th</sup> calving in Durg and Rajnandgaon districts of Chhattisgarh state to calculate the incidence of retention of fetal membranes with normal parturition, premature birth and abortion. The normally calved buffaloes with retention of fetal membranes (after 12 h) were randomly classified in treatment (n = 6) and control (n = 6) groups. The buffaloes in treatment group were administered Dinoprost (PGF<sub>2</sub> $\alpha$  analogue, 25 mg); Meloxicam (anti-inflammatory drug 0.5 mg/kg body weight.); Oxytetracycline (Broad spectrum antibiotics, 5 mg/

kg body weight) intramuscularly and intravenous calcium therapy (Calcium gluconate, 1.86% w/v; Magnesium hypophosphite, 5% w/v; Dextrose anhydrous, 20% w/v; Chlorocresol 0.1% w/v, 450 ml) after 12 after calving. However, the buffaloes in control group were not given any treatment. Blood samples were collected randomly in vacutainer tubes by jugular vein puncture aseptically after 12 h (day 0); 30 days and 45 days from both treatment and control group in normally calved buffaloes with retention of fetal membranes. Blood samples were allowed to clot at 4°C for 24 h and then centrifuged at 3000 rpm for 20 minutes in refrigerated centrifuge machine. Serum was poured into sample tubes and stored at -20°C until analysis. Blood glucose was estimated by the glucometer immediately after collection through strip method. Serum calcium and phosphorus were analyzed through diagnostic kit by semi auto-analyzer (Systronics India Ltd.). Serum concentration of magnesium was determined by Titan Yellow method (Neill and Neely, 1956), NEFA was determined by soap extraction method (chloroform: heptane: methanol, 49:49:2) as per Shipe *et al.* (1980) and progesterone by Radio Immune Assay (RIA; Kubasic *et al.*, 1984). Independent 't' test was carried out with the help of SPSS computer software.

## RESULTS AND DISCUSSION

Normal calvings were recorded 86.11% (521/605) in buffaloes while the incidence of premature birth and abortion was 8.53% (52/605) and 5.28% (32/605), respectively. The incidence of retention of fetal membranes was 9.98% (52/521), 34.61% (18/52) and 46.87% (15/32) in normal calving, premature birth and abortion,

respectively. The overall incidence of retention of fetal membrane in buffaloes was 14.04% (85/605). The present finding approximates the findings of Kumar and Kumar (1995); Arthur (1979), While Salisbury and Van Denmark (1961); Mc Donald (1969) reported the incidence of retention of placenta as 5 to 15% and 10%, in normal calvings, respectively. Gautam (2000) reported 6.09% (24/394) incidence of retention of fetal membranes in buffaloes. The incidence of retention of fetal membranes in buffaloes is affected by number of factors *viz* parity, twins and premature births; herd to herd, season, nutritional status (Choudhury *et al.*, 1993), stress and weaning practices (Azawi *et al.*, 2008; Akar and Yeldiz, 2005).

Biochemical and progesterone profiles in normally calved buffaloes with retained fetal membranes are presented in Table 1. The mean level of glucose (mg/dl) on 0 day (start

of treatment i.e. 12 h after calving), 30 and 45 days (58.66±4.41 vs 56.83±5.69; 71.16±4.52 vs 69.66±5.43 and 67.66±4.38 vs 65.0±4.66); calcium (8.7±0.27 vs 7.88±0.44; 10.35±0.80 vs 8.06±0.59 and 11.46±0.69 vs 8.06±0.30 mg/dl); Phosphorus (3.22±0.38 vs 3.09±0.27; 3.52±0.32 vs 3.20±0.30 and 3.70±0.42 vs 3.26±0.21mg/dl); magnesium (1.95±0.02 vs 1.9±0.01; 2.31±0.01 vs 1.95±0.16 and 2.46±0.01 vs 2.07±0.01 mg/dl); NEFA (0.04±0.02 vs 0.08±0.02; 0.06±0.03 vs 0.08±0.04 and 0.05±0.01 vs 0.09±0.04 mM/ml) and progesterone on day 0, 30 and 45 days (0.57±0.15 vs 0.67±0.09; 0.59±0.19 vs 0.55±0.08 and 0.46±0.07 vs 0.54±0.10 ng/dl) was recorded in treatment and control group, respectively. There was significant rise in the level of calcium (P<0.01), phosphorus (P<0.05) and magnesium (P<0.05) on day 30 and day 45 in treatment than control group. However, there was no significant difference observed in

Table 1. Biochemical profile and progesterone level in serum of buffaloes with retention of fetal membranes (12 hr after calving).

Parameter	0 days		30 days		45 days	
	Control (n = 6)	Treatment (n = 6)	Control (n = 6)	Treatment (n = 6)	Control (n = 6)	Treatment (n = 6)
Glucose (mg/dl)	56.83±5.69	58.66±4.41	69.66±5.43	71.16±4.52	65.0±4.66	67.66±4.38
Calcium (mg/dl)	7.88±0.44	8.7±0.27	8.06±0.59	10.35±0.80**	8.06±0.30	11.46±0.69**
Phosphorus (mg/dl)	3.09±0.27	3.22±0.38	3.20±0.30	3.52±0.32*	3.26±0.21	3.70±0.42*
Magnesium (mg/dl)	1.9±0.01	1.95±0.02	1.95±0.16	2.31±0.01*	2.07±0.01	2.46±0.01**
NEFA (mM/ml)	0.08±0.02	0.04±0.02	0.08±0.04	0.06±0.03	0.09±0.04	0.05±0.01
Progesterone (ng/dl)	0.67±0.09	0.57±0.15	0.55±0.08	0.59±0.19	0.54±0.10	0.46±0.07

In row \*values differ significantly (P<0.05) and \*\*differ significantly (p<0.01).

level of glucose, progesterone and NEFA between treatment and control group on day 0, 30 and 45. Similar to our findings increase level of calcium (Dutta and Dugwekar, 1983; Mohanty *et al.*, 1994; Mandali *et al.*, 2002); Phosphorus (Ban *et al.*, 1996; Akar and Yildiz, 2005; Perumal *et al.*, 2013) and magnesium (Ban *et al.*, 1996; Akar and Yildiz, 2005; Tillard *et al.*, 2008; Perumal *et al.*, 2013) was reported in treatment group on day 0, 30 and 45.

The present study indicates that the lower incidence of retention of fetal membranes in buffaloes with normal calving as compare to premature birth and abortion. Significant rise in the level of calcium, phosphorus and magnesium on day 30 and day 45 was observed in treated animals.

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