

Haemato-Biochemical Changes In Post-Partum Anoestrus Buffaloes During Low Breeding Season

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ABSTRACT: Present investigation was carried out to study the level of haemato-biochemical constituents (Hb, TLC, DLC, blood serum glucose, inorganic phosphorus and total serum cholesterol) in anoestrus buffaloes during low breeding season (March to June). The mean haemoglobin concentration was found to be significantly higher ($P < 0.01$) in normal cyclic buffaloes in comparison to anoestrus buffaloes on both 0th and 3rd day. The mean total leucocytes count in anoestrus and normal cyclic buffaloes on 0th and 3rd was statistically non significant. The mean levels of blood serum glucose, inorganic phosphorus and cholesterol were significantly higher ($P < 0.01$) in normal cycling buffaloes than the anoestrus buffaloes on 0th and 3rd day.

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KEYWORDS: Haemato-biochemical, Anoestrus, Buffalo

INTRODUCTION

Anoestrus is a major reproductive disorder in buffaloes and is mainly of nutritional origin (Kumar et al., 2003). Heat stress during low breeding season is a major factor for impairment of fertility in tropical and subtropical countries (Hala et al., 2009). Haemato-biochemical studies are important in diagnosis of healthy and diseased conditions of the animals. The blood picture may vary in normal cycling and anoestrus animals. Reduced haemoglobin concentrations were observed in anoestrus buffaloes as compared to normal cyclic buffaloes (Dhoble and Gupta, 1981 and Kumar *et al.*, 1991). Cholesterol acts as precursor of steroid hormones and its level can indicate circulatory adequacy of these hormones responsible for normal oestrus (Ramkrishna, 1997). The blood profile of calcium and phosphorus plays an important role in the action of hormones and enzymes at sub cellular levels in an integrated fashion in the initiation of oestrus in animals (Ali *et al.*, 1991 and Butani *et al.*, 2009).

MATERIALS AND METHODS

A total of 24 buffaloes belonging to villages around the college of Veterinary Science and Animal Husbandry, Mhow were selected for the present study. Out of 24 buffaloes 6 were normal cycling buffaloes and 18 were anoestrus for more than 90 days. These buffaloes were per rectally explored twice, ten days apart to confirm ovarian activity and genital status.

Approximately 15 ml of blood from each animal was collected from jugular vein on 0th day and 3rd day of 2nd per rectal examination in sterilized screw cap glass vials. Two ml of this blood was

poured in sterile vial containing anti-coagulant (EDTA @ 2 mg/ml of blood). The vial was shaken to and fro gently for sometime and marked with the glass markers for haematological study. Remaining 13 ml of blood was collected in centrifuge tubes and allowed for clotting. After completion of clotting sample were immediately transported to the laboratory and serum was separated out by centrifugation at 2500 rpm, for 10 minutes (Brar et al., 2000). Serum was collected in sterile vial and kept at - 20°C till biochemical estimation. Haematological parameters were estimated as per the procedures mentioned by Jain (1986). Blood serum glucose was estimated by Glucose-Oxidase (GOD/POD) method using Meckotest reagents kit as described by Trinder (1969) and values were expressed in mg per cent. Cholesterol was analyzed by CHOD-PAD method using Merckotest reagent kit as described by Richmond (1973) and values were expressed in mg per cent. Analysis of phosphorus was carried out by modified Metol methods using Qualigens Diagnostic kit as described by Gomorri (1972) and values were expressed in mg per cent.

RESULTS AND DISCUSSION

Haematological change

The mean hematological values in anoestrus and normal cycling buffaloes are presented in table 1.

Haemoglobin

The mean haemoglobin concentration in anoestrus and normal cycling buffaloes was 9.81 ± 0.21 and 12.63 ± 0.49 mg percent and 9.87 ± 0.21 and 12.73 ± 0.49 mg percent on 0th day and 3rd day, respectively. The mean haemoglobin concentration obtained in normal cycling buffaloes was

significantly higher ($P < 0.01$) than the anoestrus buffaloes on 0th and 3rd day. The present findings are in accordance with the finding of Dhoble and Gupta (1981) and Kumar *et al.* (1991).

The low value of haemoglobin in anoestrus buffaloes, in the present study may be due to poor

nutrition and anaemic condition of the buffaloes while higher value in normal cycling buffaloes reflect their body condition and nutritional status as the animals included in the study were reared under different field conditions.

Table 1: Mean values of haematological constituents in normal cyclic and anoestrus buffaloes (Mean \pm S.E.)

Parameters	Control (n=6)		Anoestrus (n=18)	
	0 th day	3 rd day	0 th day	3 rd day
Haemoglobin (gm %)	12.63 ^b \pm 0.49	12.73 ^b \pm 0.49	9.81 \pm 0.21	9.87 \pm 0.21
TLC (10 ³ /ml of blood)	7.11 ^a \pm 0.21	7.30 ^a \pm 0.17	8.18 \pm 0.34	8.16 \pm 0.50
Neutrophils (%)	27.50 \pm 0.91	27.50 \pm 1.33	25.29 \pm 2.35	27.77 \pm 2.18
Lymphocytes (%)	64.83 \pm 2.41	64.50 \pm 1.45	68.10 \pm 2.88	65.61 \pm 2.17
Monocytes (%)	4.00 \pm 0.66	4.50 ^b \pm 0.45	2.61 \pm 0.44	2.44 \pm 0.52
Eosinophils (%)	2.33 \pm 0.51	2.66 \pm 0.51	2.77 \pm 0.73	3.27 \pm 0.69
Basophils (%)	1.33 \pm 0.30	0.83 \pm 0.28	0.55 \pm 0.29	0.88 \pm 0.22

Mean with same superscript do not differ significantly from each other.

Table 2: Mean values of biochemical constituents in normal cyclic and anoestrus buffaloes (Mean \pm S.E.)

Parameters	Control (n=6)		Anoestrus (n=6)	
	0 th day	3 rd day	0 th day	3 rd day
Serum glucose (mg/100ml)	71.85 ^b \pm 2.44	72.38 ^b \pm 2.65	50.94 \pm 1.86	51.39 \pm 2.24
Serum total cholesterol (mg/100ml)	130.86 ^c \pm 3.80	132.49 ^c \pm 3.39	74.83 \pm 2.06	75.32 \pm 1.92
Serum inorganic phosphorus (mg/100ml)	6.02 ^b \pm 0.18	6.22 ^b \pm 0.15	3.92 \pm 0.14	3.94 \pm 0.14

Mean with same superscript do not differ significantly from each other.

Total Leucocyte count

The mean total leucocyte count in anoestrus and normal cycling buffaloes was 8.18 \pm 0.34 and 7.11 \pm 0.2 thousand/cumm and 8.16 \pm 0.50 and 7.30 \pm 0.17 thousand/cumm on 0th day and 3rd day, respectively. There was no significant difference in mean leucocyte count between anoestrus and normal cycling buffaloes on 0th day and 3rd day. These findings are in accordance with the reports of Patil *et al.* (1992) and Horadagoda *et al.* (2002).

The mean neutrophil, lymphocyte, monocyte, eosinophil and basophile count in anoestrus and normal cyclic buffaloes was non significant on 0th and 3rd day. Similar findings were also reported by Brar *et al.* (2000).

Biochemical Changes

The mean biochemical values in anoestrus and normal cycling buffaloes are presented in table 2.

Blood serum glucose

The mean blood serum glucose level in anoestrus and normal cycling buffaloes was 50.94 \pm 1.86 and 71.85 \pm 2.44 mg percent and 51.39 \pm 2.24 and 72.38 \pm 2.65 mg percent on 0th day and 3rd day, respectively. The mean blood serum glucose level obtained in normal cycling buffaloes was significantly higher ($P < 0.01$) in comparison to

anoestrus buffaloes on both 0th day and 3rd day. Similar findings were also reported by Shrivastava and Kharche (1986), Umesh *et al.* (1995) and Kabir *et al.* (2001).

The lower level of serum glucose in anoestrus buffaloes might be due to hypothalamic failure in utilizing the glucose or may be due to lower energy intake (McClure, 1965).

Serum inorganic phosphorus

The mean total serum inorganic phosphorus in anoestrus and normal cycling buffaloes was 3.92 \pm 0.14 and 6.02 \pm 0.18 mg/100ml and 3.94 \pm 0.14 and 6.22 \pm 0.15 mg/100ml on 0th day and 3rd day, respectively. It was found significantly higher in normal cycling buffaloes than the anoestrus buffaloes on 0th and 3rd day. The present findings are in accordance with reports of Dabas *et al.* (1987) and Umesh *et al.* (1995). On the contrary Butani *et al.* (2009) reported higher level of inorganic phosphorus in anoestrus buffaloes.

Anoestrus, irregular and delayed sexual maturity are the consequence of phosphorus deficiency (Radostits *et al.*, 2000). The lower level of inorganic phosphorus in anoestrus buffaloes may be due to lack of phosphorus in the diet, which affects the reproduction of buffaloes resulting in anoestrus.

Total Serum Cholesterol

The mean total serum cholesterol in anoestrus and normal cycling buffaloes was 74.83 ± 2.06 and 130.86 ± 3.80 mg/100ml and 75.32 ± 1.92 and 132.49 ± 3.39 mg/100 ml on 0th day and 3rd day, respectively. The level in normal cycling buffaloes was significantly higher ($P < 0.01$) than the anoestrus buffaloes on 0th day and 3rd day. Present findings are in accordance with reports of Murthy and Rao (1981), Sarvaiya and Pathak (1991), Amanullah et al. (1997) and Kabir et al. (2001).

The present findings revealed significantly low concentration of cholesterol during anoestrus in buffaloes. The estrogen influences lipid metabolism through lipogenesis, which in turn causes increased production of cholesterol. This may be directly proportional to the production of cholesterol and changes in the physiological status of animals (Hafez, 1980).

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