BLOOD BIOCHEMICAL PROFILE IN REPEAT BREEDING MEHSANA BUFFALOES

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Received 30-6-2012 Accepted 24-09-2012

ABSTRACT

Blood biochemical constituents play an important role in maintaining fertility. The biochemical attributes glucose, total protein, albumin and globulin showed noticeable significant increase in treated Group-I (Cephalexin) and Group- II Ciprofloxacin+Tinidazole) as compared to untreated Group-III (control), whereas cholesterol levels were not affected significantly in present study. However the concentration of glucose in blood plasma of Group-III was significantly lower ($P<0.05$) as compared to treated Groups-I and II during all phases of oestrus cycle except on day of oestrus. These biochemical indices were significantly low in repeat breeding Mehsana buffaloes which were indicative of non infectious causative factors for repeat breeding condition.

KEY WORDS : Buffalo, Oestrus cycle , Repeat breeder

INTRODUCTION

Changes in biochemical constituents of blood are important indicators of physiological status of an animal (Perveen and Usmani, 1993). Changes in various biochemical constituents have been blamed for reproductive failures. Thus, serum biochemical profile might be a potential aid in characterizing these problems. Blood glucose appears to be one of the key nutrients affecting cyclicity in farm animals and a minimum level of 40-60 mg/100 ml is required to maintain the physiological processes of the body (Duke, 1970). High incidence of repeat-breeding and anoestrus are associated with the deficiencies of cholesterol, glucose, protein, albumin and globulin (Arosh *et al*., 1998). Hence the present study was undertaken to evaluate the biochemical profile of repeat breeder Mehsana buffaloes.

MATERIALS AND METHODS

Eighteen healthy repeat breeder Mehsana buffaloes were selected. They were divided into 3 groups each of six animals. Animals of Group-I and II were treated (intra-uterine route) once with 4 gm Cephalexin powder and Ciprofloxacin 125 mg + Tinidazole 150 mg each dissolved in 60 ml of distilled water respectively, whereas in Group-III no treatment was advocated. Blood samples were obtained in heparinised vials on days 0, 3, 12, 17 and 24 of oestrus cycle. Biochemical constituents like glucose, total protein, albumin, globulin and cholesterol were analyzed in blood plasma of repeat breeding Mehsana buffaloes as per routine standard methods . Data was analyzed statistically using factorial completely randomized design (Snedecor and Cochran, 1994).

RESULTS AND DISCUSSION

The significantly higher ($P<0.05$) level of glucose was found in blood plasma of Group-I than Group-II during all the stages of oestrus cycle except on day of oestrus (Table. 1). The non-significant difference was observed among two Subgroups except on 3rd day while significantly lower ($P<0.05$) concentration of glucose was observed in Group-III than Groups-I and II except on day of oestrus. The trend of significantly higher blood glucose levels in Groups-I and II than the Group-III were in agreement with the results obtained by Nejad and Javed (2003) and Chandrahar *et al*. (2003) in cows and Shrivastava and Kharche (1986) in buffaloes. Whereas, Ramakrishna (1996) and Singh

and Pant (1998) reported non-significant differences in normal cyclic and repeat breeder cows. No significant differences in plasma glucose levels among repeat breeding and regular breeding buffaloes were observed by Jayachandran *et al*. (2007). The significant differences were observed between two Groups I and II on 3rd day of oestrus.The present study revealed that the repeat breeding buffaloes persistently kept high blood glucose levels especially in early luteal phase and early follicular phase of treatment which was in agreement with the results obtained by Parmar *et al*. (1986)

The mean plasma total protein levels among Group-I were significantly higher than Group-III except

Table 1. Blood plasma biochemical constituents at different phases of oestrus cycle in repeat breeding Mehsana buffaloes.

Days of oestrus cycle	Groups	Glucose (mg/dl)	Total Protein (g/dl)	Albumin (g/dl)	Globulin (g/dl)	Cholesterol (mg/dl)
0th day	Group-I	50.38±2.043^{a}	7.070±0.348^{a}	3.771±0.085^{a}	3.296±0.327^{a}	120.41±3.203
	Group-II	51.65±1.871^{a}	7.515±0.454^{b}	3.786±0.108^{a}	3.728±0.515^{b}	121.91±3.041
	Group-III	50.75±1.808^{a}	6.701±0.133^{c}	3.506±0.076^{b}	2.595±0.163^{a}	118.32±1.508
3rd day	Group-I	55.15±1.217^{a}	6.945±0.381^{a}	3.641±0.098^{a}	3.303±0.410^{a}	118.62±2.439
	Group-II	50.01±3.004^{b}	7.758±0.260^{b}	3.673±0.179^{a}	4.086±0.294^{b}	123.20±1.664
	Group-III	43.36±1.204^{c}	6.415±0.402^{c}	3.456±0.138^{b}	2.956±0.439^{a}	98.65±1.630
12th day	Group-I	51.55±0.578^{a}	6.556±0.270^{a}	3.743±0.072^{a}	2.813±0.321^{a}	128.63±2.756
	Group-II	52.36±1.638^{a}	6.648±0.152^{a}	3.486±0.096^{b}	3.161±0.215^{a}	119.22±1.575
	Group-III	43.28±1.619^{b}	6.368±0.318^{a}	3.403±0.094^{b}	2.965±0.285^{a}	97.63±1.959
17th day	Group-I	47.82±2.919^{a}	6.960±0.342^{a}	3.853±0.068^{a}	3.108±0.341^{a}	114.60±2.058
	Group-II	48.71±2.265^{a}	6.758±0.398^{ab}	4.078±0.192^{b}	2.678±0.475^{b}	117.05±2.103
	Group-III	42.05±0.500^{b}	6.440±0.177^{b}	3.625±0.086^{c}	2.815±0.194^{ab}	92.90±2.940
24th day	Group-I	49.83±1.572^{a}	5.783±0.075^{a}	3.608±0.055^{a}	2.173±0.077^{a}	119.23±1.817
	Group-II	50.13±2.133^{a}	7.461±0.295^{b}	3.811±0.176^{b}	3.815±0.356^{b}	123.12±1.914
	Group-III	44.38±0.873^{b}	6.321±0.090^{c}	3.526±0.141^{a}	2.795±0.169^{c}	96.59±3.044

Note: *Means bearing different superscripts between the rows differ significantly at 5 % level*

Group-I: Treated with Cephalexin, Group-II: Treated with Ciprofloxacin+Tinidazole

Group-III- Untreated control

on 12th day of oestrus cycle (Table. 1) which were in agreement with those obtained by Gandotra *et al.* (1993) and Jayachandran *et al.* (2007) in buffaloes and Patel *et al.* (2005) and Khan *et al.* (2010) in cows whereas non-significant differences in the level of total protein were observed by

Chandrahar *et al.* (2003) and Das and Bisnoi (2005) in cows. In present study significant differences were observed on 17th day in Group-I and Group-II which were in agreement with the observations made by Agarwal *et al.* (1982) in buffaloes. Rise of plasma total protein might be associated with the high level of estrogenic activity.

Present finding revealed that significant differences in albumin were observed among all days of oestrus cycle between Group-II and Group-III except on 12th day (Table. 1) and these findings were in agreement with the observations made by Jayanthi *et al.* (2003) and Khan *et al.* (2010) in cows, whereas, non-significant differences were observed by Sharma *et al.* (1984) and Nejad and Javed (2003) in cows and Latif *et al*. (2006) in buffaloes. Mean plasma concentrations of albumin on 17th day were significantly higher as compared to other days of oestrus cycle in present study and these findings were in agreement with Khan *et al.* (2010) who observed that the albumin concentration was the highest on day 20 of the cycle. The higher level of albumin in Groups-I and II as compared to Group-III revealed increased demand for amino acids and protein for the biosynthesis of GnRH and LH to initiate ovulation (Khan *et al.,* 2010).

The significant differences in Globulin were observed on 24th day of oestrus cycle between Groups-I, II and Group-III while significant differences were also found on 0th and 3rd day of oestrus cycle between Group-II and Group-III (Table. 1). Present findings were in agreement with the observations made by Khan *et al.* (2010) who reported significantly lower level ($P < 0.01$) of globulin on day 20th of the cycle when compared with day 5 of the cycle whereas non-significant differences were observed by Sharma *et al.* (1984) and Cetin *et al.* (2002) in cows and Latif *et al.* (2006) in buffaloes. Mean plasma concentrations of globulin on 17th day were lower as compared to other days of oestrus cycle in present study which was in close proximity with the Khan *et al.* (2010) who recorded significantly lower level ($P < 0.01$) of globulin on day 20th of the cycle .It has been suggested that globulin functions as a carrier protein for copper, alters the biosynthesis of specific coenzymes and thus helps in steroidogenesis during early luteal phase of the cycle in repeat breeder animals.

Present findings revealed that the concentrations of blood plasma cholesterol (mg/dl) in all three groups did not differ significantly. Differences in blood plasma cholesterol (mg/dl) were also non-significant between Groups-I, II and Group-III during all phases of oestrus cycle (Table. 1). These findings were in agreement with Shah *et al*. (2003) who reported non-significant differences in the mean levels of total cholesterol in postpartum fertile and infertile surti buffaloes. However, significant differences were recorded by Das and Bisnoi (2005) and Khan *et al*. (2010) in cows and Shrivastava and Kharche (1986) in buffaloes The highest level of cholesterol was recorded on 10th day of the oestrus cycle in Subgroup-II which was in agreement with the observations made by Khan *et al.* (2010) who also made the similar observations in repeat breeder cows. Agarwal *et al*. (1982) reported no cyclic change in the cholesterol levels on days 1st, 13th and 16th of the oestrus cycle. Biochemical constituents like Glucose, Total Protein, Albumin and Globulin were significantly low in repeat breeding Mehsana buffaloes which were indicative of non infectious causative factors for repeat breeding condition.

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