Wayamba Journal of Animal Science – ISSN: 2012-578X; P719-P722, 2013
First Submitted March 03, 2013; Number 1362323638

EFFECT OF ANTIBIOTIC THERAPY ON BLOOD PLASMA BIOCHEMICAL CONSTITUENTS IN REPEAT BREEDER MEHSANA BUFFALOES

F. M. Kapadiya, G. M. Siddiquee, T. V. Sutariya, B. R. Patel and S. M. Parmar

Department of Animal Reproduction, Gynaecology and Obstetrics, College of veterinary science and animal husbandry, Sardarkrushinagar dantiwada agricultural university, Sardarkrushinagar – 385 506

Blood plasma biochemical constituents play an important role in maintaining fertility hence experiment was carried out to study the biochemical parameters like blood urea nitrogen, creatinine kinase and cholinesterase in blood plasma of repeat breeding mehsana buffaloes following antibiotic treatment. Total eighteen health repeat breeder Mehsana buffaloes were selected and divided in three groups. Animals of Subgroups-I and II were treated with 4 gm Cephalexin powder and Ciprofloxacin 125 mg + Tinidazole 150 mg each dissolved in 60 ml of distilled water respectively, once only by intra uterine route, whereas in Group-II no treatment was advocated. Blood urea nitrogen levels showed noticeable significant changes which were comparatively higher in antibiotics treated Group-I as compared to untreated control (Group-II), whereas creatinine kinase and cholinesterase levels were not affected significantly which may be indicative of non infectious causative factors for repeat breeding condition.

Key words: Blood urea nitrogen, Buffalo, Cholinesterase, Creatinine kinase, Repeat breeder

Changes in various biochemical constituents have been blamed for reproductive failures. Therefore serum biochemical profile might be a potential aid in characterizing these problems. Qureshi (1998) reported higher blood urea nitrogen level in anoestrus animals than those resuming cyclicity within 45 days postpartum.

Deranged enzymatic activity reflects the reproductive failure. Enzymes play an intermediate role in the promotion of action of hormones and enzymes at sub-cellular level in integrated fashion (Dhoble and Gupta, 1986). Acetylcholine is released by cholinergic nerves and it has been reported by Hafez (1980) that it produces oviductal contraction inspite of absence of any pharmacological evidence of cholenergic innervations to the oviductal musculature. Depressed cholinesterase activity affects indirectly on pituitary gland which results in reduced synthesis and release of gonadotrophins (Shalaby *et al*. 1998). Cetin *et al*. (2002) indicated that there was non-significant elevation of creatinine level in repeat breeding cows as compared to fertile cows. Sattler and Furll (2004) and Azawi *et al.*, (2008) indicated significantly higher creatinine values in buffaloes with endometritis due to the destruction of cells of uterine wall mainly in the chronic type of inflammation which induced an increase in serum creatinine level.

MATERIALS AND METHODS

Eighteen otherwise healthy repeat breeder Mehsana buffaloes were selected from the villages on the basis of breeding history and detailed gynecological examination. They were divided in to 3 groups each of six animals. Animals of Group-I (Subgroup-I and II) were treated with intra-uterine route once only with 4 gm Cephalexin powder and Ciprofloxacin 125 mg + Tinidazole 150 mg each dissolved in 60 ml of distilled water respectively, whereas in Group-II no treatment was advocated. Blood samples were obtained in heparinised vials on days 0, 3, 12, 17 and 24 of oestrus cycle to study the levels of blood urea nitrogen and enzymes like cholinesterase and creatinine kinase.

 Copyright © Society of Animal Science, Department of Livestock & Avian Science, Wayamba University of Sri Lanka

RESULTS AND DISCUSSION

Mean blood urea nitrogen concentrations (mg/dl) were found to be varied from 22.26 ± 2.611 to 25.19 ± 1.619, 23.15 ± 1.795 to 24.99 ± 1.743 and 17.56 ± 1.152 to 19.72 ± 1.590 mg/dl in Subgroup-I, Subgroup-II and Group-II, respectively. The differences in the blood urea nitrogen concentrations between two Subgroups were non-significant. Similar findings were obtained by Cetin *et al.* (2002) and Ahmad *et al.* (2004) in cows whereas significant differences were observed between Group-I and Group-II in present study which was in accordance with the findings recorded by Parmar *et al.* (1986). The blood urea nitrogen concentration on day of oestrus in Group-II was higher than 3rd, 12th, 17th, and 24th days of oestrus cycle. These findings were also supported by Parmar *et al.* (1986) who recorded highest blood urea nitrogen level on day of oestrus in repeat breeding crossbred cows (28.88 ± 1.89 mg%). Lubna Jabbar (2004) explained that the different levels of energy had affected the blood urea nitrogen ($P<0.01$) significantly. The highest values were observed in blood of growing heifers fed on high energy levels while these values were lowest in heifers which were offered low energy ration. They also observed significant seasonal effects on blood urea nitrogen values. The highest values were found during autumn, whereas lowest values were noted during winter.

Mean creatinine kinase concentrations (u/l) were found to be varied from 203.45 ± 1.448 to 214.20 ± 1.769, 204.24 ± 1.650 to 216.13 ± 2.356 and 185.69 ± 1.121 to 202.51 ± 2.088 u/l in Subgroup-I, Subgroup-II and Group-II, respectively, during different phases of oestrus cycle. In the present findings there were no significant

Table. 1. Blood plasma concentrations of blood urea nitrogen, creatinine kinase and cholinesterase at different phases of oestrus cycle in repeat breeding Mehsana buffaloes.

Days of oestrus cycle	Groups		Blood urea nitrogen (mg/dl)	Creatinine kinase (u/l)	Cholinesterase (u/l)
0th day	Group-I	Sub group-I	22.26±2.611[a]	214.20±1.769	818.81±1.420
		Sub group-II	23.65±2.050[a]	216.13±2.356	853.71±1.842
	Group-II		19.72±1.590[b]	198.96±2.286	840.91±1.940
3rd day	Group-I	Sub group-I	24.24±1.464[a]	204.76±1.324	798.73±2.628
		Sub group-II	24.99±1.743[a]	212.99±1.048	810.14±1.199
	Group-II		18.58±0.703[b]	202.51±2.088	785.48±1.411
12th day	Group-I	Sub group-I	23.08±1.876[a]	203.45±1.448	780.15±1.872
		Sub group-II	23.15±1.795[a]	205.49±1.722	763.29±1.642
	Group-II		17.56±1.152[b]	196.73±1.853	805.63±1.424
17th day	Group-I	Sub group-I	24.04±2.479[a]	206.77±1.436	819.07±1.338
		Sub group-II	23.38±1.069[a]	204.24±1.650	866.08±1.769
	Group-II		19.58±0.768[b]	201.44±1.166	816.95±1.779
24th day	Group-I	Sub group-I	25.19±1.619[a]	209.65±1.959	808.03±1.747
		Sub group-II	24.80±1.627[a]	210.16±1.780	816.24±2.117
	Group-II		19.45±1.669[b]	185.69±1.121	794.32±2.066

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

Copyright © Society of Animal Science, Department of Livestock & Avian Science, Wayamba University of Sri Lanka

differences between Groups-I and II. These patterns of non-significant differences observed in Group-I and Group-II in the present study were in agreement with the results obtained by Azawi *et al.* (2008) who reported buffaloes with endometritis with higher creatinine kinase (321.47 ± 39.06 vs 162.01 ± 16.41 U/l) activities ($p < 0.05$) than control-heifers, but no significant differences were observed between buffaloes with endometritis in creatinine kinase (321.47 ± 39.06 vs 208.33 ± 5.84 U/l) activities than control pluriparous buffaloes. Marai *et al.* (1992) studied on typical repeat breeding and its improvement in buffaloes and stated that repeat breeding significantly ($P < 0.05$) surpassed normal buffaloes in creatinine kinase values.

Mean cholinesterase concentrations (u/l) were found to be varied from 780.15 ± 1.872 to 819.07 ± 1.338, 763.29 ± 1.642 to 866.08 ± 1.769 and 785.48 ± 1.411 to 840.91 ± 1.940 u/l in Sub group-I, Subgroup-II and Group-II, respectively, during different phases of oestrus cycle. The difference in the plasma levels of cholinesterase (u/l) within Group-I (Subgroups-I and II) and Group-II were non-significant during different phases of oestrus cycle, whereas contradictory results were observed by Latif *et al.* (1993) who had estimated level of cholinesterase enzyme as 4.35±1.93 and 13.95±1.91 µmol in anoestrus and normal cycling buffaloes, respectively, which were highly significant ($P<0.01$). Ahmed (2007) stated that indirect action of environmental pollution like pesticides through the pituitary gland with reduced synthesis and release of gonadotrophins may be involved as a result of depressed cholinesterase activity.

REFERENCES

1. Ahmad, I. Lodhi, L. A., Qureshi, Z. I. and Younis, M. (2004). Studies on blood glucose, total proteins, urea and cholesterol levels in cyclic, non-cyclic and endometritic crossbred cows. *Pak. Vet. J.*, 24(2): 92-94
2. Ahmed, W. M. (2007). Overview on some factors negatively affecting ovarian activity in large farm animals. *Global Veterinaria*, 1(1): 53-66.
3. Azawi, O. I., Omran, S. N. and Hadad, J. J. (2008). A study on repeat breeding of Iraqi buffalo cows. Buffalo Bulletin, 27(4): 274-283
4. Cetin, M., Dogan, I., Polat, U., Yalcin, A. and Turkyilimaz, O. (2002). Blood biochemical parameters in fertile and repeat breeder cows. Indian J. Anim. Sci., 72(10): 865-866.
5. Dhoble, R. L. and Gupta, S.K. (1986). Semen calcium and inorganic phosphorus level during post partum anoestrus buffaloes. Indian J. Anim. Hlth.,25: 123-126.
6. Hafez, E. S. E. (1980). Reproduction in Farm Animals. 4th ed. Lange Medical Publications, Los Altos, California.
7. Lubna Jabbar. (2004). Effect of different dietary energy levels on some growth and reproductive aspects and their relation with age of maturity in growing buffalo heifers. Ph.D. Thesis submitted to University of Punjab, Lahore, Pakistan.
8. Latif, A. Siddiquee, G. M. and Vadodaria, V. P. (1993). Biochemical studies on post-partum anoestrus in Mehsani buffaloes. Indian J. Anim. Reprod., 14(1): 64.
9. Marai, I. F., El-Darawany, A. A. and Nasr, A. S. (1992). Typical repeat breeding and its improvement in buffaloes. Beitr. Trop. Landwirtsch Veterinarmed., 30(3): 305-14.
10. Parmar, K. S., Mehta, V. M. and Patel, J. M. (1986). Biochemical profile of repeat breeding crossbred cattle in relation to different phase of oestrous cycle. Indian. J. Anim. Reprod., 7(2): 31-35.
11. Qureshi, M. S. (1998). Relationship of pre and post partum nutritional status with reproductive performance in Nili-Ravi buffaloes under the conventional farming system in NWFP, Pakistan. Ph.D. Thesis, Univ. Agric. Faisalabad, Pakistan.

Copyright © Society of Animal Science, Department of Livestock & Avian Science, Wayamba University of Sri Lanka

12. Sattler, M. and Furll, H. (2004). Creatine kinase and aspartate aminotransferase in cows as indicators for endometritis. J. Vet. Med. Assoc., 51: 132-137.

13. Shalaby, S. I., Ahmad, W. M. and Amer, H. A. (1998). Reproductive problems in farm animals exposed to pesticides with emphasis on sheep. Egyptian Comp. Pathol.Clinical Pathol. 11: 46-56

Copyright © Society of Animal Science, Department of Livestock & Avian Science, Wayamba University of Sri Lanka