

## COMPARATIVE STUDIES ON HAEMATO- BIOCHEMICAL CONSTITUENTS IN ANOESTRUS BOVINE

P. M. MANE<sup>1</sup>, V. D. AHER<sup>2</sup>, A. M. SYED<sup>3</sup> & P. B. GHORPADE<sup>4</sup>

<sup>1,3</sup>Hospital Registrar, COVAS, Parbhani, M.S., India

<sup>2</sup>Professor, COVAS, Parbhani, M.S., India

<sup>4</sup>Assistant Professor, COVAS, Parbhani, M.S., India

### ABSTRACT

*This study was conducted to evaluate efficacy of polyherbal and mineral drug for the treatment of anoestrus in bovine. The trial was conducted at Teaching Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Parbhani and some of the local farms in and around Parbhani district. Twenty anoestrus affected animals were treated with Estrona Forte Bolus and Minarex Bolus. Blood samples were analysed before and after treatment for haemoglobin, Calcium, Phosphorus and Glucose. Highly significant variations ( $P < 0.05$ ) in haemoglobin ( $11.78 \pm 0.21$  vs  $12.39 \pm 0.19$  g/dl) and significant variations ( $P < 0.01$ ) in calcium ( $9.90 \pm 0.27$  vs  $10.44 \pm 0.25$  mg/dl) before and after treatment of anoestrus bovine were observed, respectively. However, non-significant variations in phosphorus ( $5.08 \pm 0.14$  vs  $5.21 \pm 0.14$  mg/dl) and glucose ( $49.76 \pm 1.23$  vs  $49.91 \pm 1.15$  mg/dl) before and after treatment of anoestrus bovine were observed, respectively. It may be concluded that from the present study, in anoestrus bovine the combined therapy of polyherbal heat inducer and mineral supplementation helped in rising haemato- biochemical level which ultimately enhance the estrous inducing ovarian activity.*

**KEYWORDS:** Anoestrus, Haematological and Biochemical Constituents & Herbal Treatment

**Received:** Jan 03, 2018; **Accepted:** Jan 24, 2018; **Published:** Feb 02, 2018; **Paper Id.:** IJASRFEB201817

### INTRODUCTION

Feeding plays an important role in any livestock development and also for optimum expression of genetic potential of livestock. Though the production and reproduction abilities of animals depend on their genetic potential, it is always prudent to feed them with optimum quantities of different macro as well as micronutrients to exploit their maximum productive and reproductive potentials. Under the tropical Indian condition, the metabolic and/or deficiency diseases in animals are quite common which are mainly due to non availability of balanced diet and also deficiency of specific minerals (Ramesh Kumar *et al.*, 2012).

Anoestrus is one of the most commonly occurring reproductive problems in cattle and buffalo in India, affecting livestock productivity and economics to a great extent. The problem is more severe in sub urban and rural areas of the country. It is a functional disorder of the reproductive cycle which is characterized by absence of overt signs of estrus manifested either due to lack of expression of estrus or failure of its detection (Kumar *et al.*, 2014). Normal levels of biochemical constituents are of utmost importance for maintaining the functional integrity of the reproductive system (Niazi *et al.*, 2003).

Hence, the present study was undertaken to study some haemato- biochemical constituents in anoestrus

bovine before and after treatment.

## MATERIALS AND METHODS

Twenty clinical cases of bovine presented to Teaching Veterinary Clinical Complex, College of Veterinary and Animal Sciences, Parbhani and some of the local farms in and around Parbhani town during October 2016 to March 2017 with history and clinical signs of anoestrus were selected for the present therapeutic trial.

As per history, all the selected animals did not show any clinical sign of oestrus for more than five months after calving. All the animals were examined twice an interval of eight days for confirmation of anoestrus by gynaeco-clinical findings of smooth and inactive ovaries without persistent corpus luteum and no uterine pathology. It was confirmed that all the selected animals were free from any other diseases. It was ensured that all the experimental animals were maintained with standard managerial practices during the period of experiment. The deworming of all selected animals with standard dewormer, orally one week before the commencement of treatment. Twenty anoestrus affected animals were treated per orally with Estrona forte bolus (2 boli once daily for 5 days) and Minarex bolus (1 bolus BID daily for five days). Those cows failed to exhibit oestrus within 15<sup>th</sup> days were given once repeated dose of above treatment.

Blood sample from the experimental animals were collected in the morning hours for haematological and biochemical estimation. Blood samples (total 40 samples) were collected aseptically from jugular venepuncture of all experimental bovine before and after treatment (on the day of onset oestrus). The all venous blood samples collected in a clean and sterilized test tube for serum separation. Serum samples were centrifuged at 300 RPM for 10 minutes. After separating from the clot, sera was stored at  $-20^{\circ}\text{C}$  until used for biochemical estimations. Blood samples were analysed for haemoglobin (Hb), Calcium (Ca), Phosphorus (P) and Glucose (Glu) estimation. Haemoglobin concentration (g/dl) was estimated by using Sahlie's Haemoglobinometer. The Calcium, Phosphorus and Glucose were analysed by using semiautomatic biochemical analyser (Erba, CHEM-7)/ Spectrophotometer. The glucose (mg/dl), inorganic phosphorus (mg/dl) and calcium (mg/dl) were estimated by GOD/POD methods, UV-molybdate method and O-CPC methods, respectively by using commercial standard biochemical kits manufactured by Ambica Diagnostics, W-7, MIDC, Parbhani, Maharashtra. The data was analysed according to the methods described by Snedecor and Cochran (1994) by utilizing paired 't' test.

## RESULTS AND DISCUSSIONS

### Hematological and Biochemical Parameters

The results on hematological and biochemical parameters of bovine are shown in Table 1. In present investigation, Highly significant variations ( $P < 0.05$ ) in haemoglobin ( $11.78 \pm 0.21$  vs  $12.39 \pm 0.19$  g/dl) and significant variations ( $P < 0.01$ ) in calcium ( $9.90 \pm 0.27$  vs  $10.44 \pm 0.25$  mg/dl) before and after treatment of anoestrus bovine were observed, respectively. Non-significant variations in phosphorus ( $5.08 \pm 0.14$  vs  $5.21 \pm 0.14$  mg/dl) and glucose ( $49.76 \pm 1.23$  vs  $49.51 \pm 1.15$  mg/dl) before and after treatment of anoestrus bovine were observed, respectively.

### 1. Heamoglobin

Highly significant ( $P < 0.05$ ) variations in heamoglobin (Hb) concentration ( $11.78 \pm 0.21$  vs  $12.39 \pm 0.19$  g/dl) was found before and after treatment of anoestrus bovine. The Hb concentration of present study was agreement with Mukane, (1998) in anoestrus buffaloes. Whereas Babar, (1998) reported lower Hb concentration in anoestrus cows. However,

Bijurkar, (1996) was found non-significant difference in cows with different herbal heat inducer and without mineral supplementation. Sharadkumar *et al.* (2010), Ali and Shukla (2012) and Pariza *et al.* (2013) reported significant variation in anoestrus and regular cyclic bovines, respectively. Though the importance of the Hb level has not been directly implicated in reproductive disorders, yet a decrease in Hb value is indicative of certain systemic disorders which could indirectly affect the functional activity of the reproductive organs (Sharadkumar *et al.*, 2010). A low level of Hb influences tissue oxygenation of the reproductive tract, which in turn could affect the cyclicity (Ramakrishna, 1997).

## 2. Calcium

The significant variations ( $P < 0.01$ ) were observed in calcium (Ca) concentration ( $9.90 \pm 0.27$  vs  $10.44 \pm 0.25$  mg/dl) before and after treatment of anoestrus bovine. The present values are agreement with Mukane, (1998) in anoestrus buffaloes. Whereas Babar, (1998) reported lower Ca concentration in anoestrus cows with different herbal heat inducer and without mineral supplementation. In general, the level of blood Ca alone might not affect the normal reproductive physiology of animals directly but alteration of Ca: P ratio affected the ovarian function through its blocking action on pituitary gland and resulted in prolongation of first oestrus and ovulation (Jayachandran, *et al.* 2013).

## 3. Phosphorus

In the present study, before treatment animals had non-significantly higher phosphorus (P) level ( $5.08 \pm 0.14$  mg/dl vs  $5.21 \pm 0.14$  mg/dl) as compare to after treatment animals. After treatment, the lower values are reported by Babar, (1998) and Mukane, (1998) in anoestrus cow and buffaloes, respectively with different herbal heat inducer and without mineral supplementation. A close correlation between the reproductive hormones and inorganic P exist and marginal P deficiency may lead to anoestrus condition (Hurley and Doane, 1989). Moderate deficiency may lead to repeat breeding and low conception rates whereas severe deficiency may delay onset of puberty and post partum oestrus because of inactive ovaries (Pugh *et al.*, 1985).

## 4. Glucose

The mean serum glucose levels in before and after treatment of anoestrus animals were  $49.76 \pm 1.23$  and  $49.91 \pm 1.15$  mg/dl, respectively. It was non-significantly lower in before treatment anoestrus animals than that of after treatment anoestrus animals. Whereas, Mukane, (1998) reported lower glucose concentration in anoestrus buffaloes with different herbal heat inducer and without mineral supplementation. Presence of higher level of serum glucose in cyclic cows has been observed by many research workers (Arosh *et al.* 1998; Singh and Singh, 2005; Das *et al.* 2016, while some workers did not find any significant difference in serum glucose level between cyclic and anoestrus animals (Kumar and Sharma, 1991 and Jayachandran *et al.* 2013). The serum glucose level has been acclaimed to be a reasonably accurate test to measure the energy status of the animal (Madan, 1979). The low level of serum glucose in anoestrus animals before treatment was observed in the present investigation indicates the poor energy status and a consequent infertile condition of the anoestrus cows.

The difference in the level of haemato- biochemical constituents in blood recorded by various authors may be due to variation in composition of drug, breed, species, age, nutritional status, environment, managerial practices, endocrine status, dose level and observation period. It may be concluded that from the present study, in anoestrus bovine the combined therapy of polyherbal heat inducer and mineral supplementation helped in rising haemato- biochemical level which ultimately enhance the estrous inducing ovarian activity.

## ACKNOWLEDGEMENT

We are very grateful to Chairman, Rakesh Pharmaceuticals, Kalol, Dist: Gandhinagar (North Gujarat) for sponsoring and providing free samples to carry out this project. We are thankful to Associate Dean, College of Veterinary and Animal Sciences, Parbhani for providing the necessary facilities to carry out this project.

## REFERENCES

1. Ali, R., & Shukla, S. P. (2012). Haemato-biochemical changes in post-partum anoestrus buffaloes during low breeding season. *Researcher*, 4(9), 55-58
2. Arosh, A. J., Kathiresan, D., Devanathan, T. G., Rajasundaram, R. C., & Rajasekharan, J. (1998). Blood biochemical profile in normal cyclic and anoestrus cows. *Indian Journal of Animal Science*, 68(11), 1154-1156
3. Babar, V. B. (1998). Studies on clinical efficacy of indigenous drug in induction of oestrous and ovulation in Deoni and crossbred cows. M.V.Sc. Thesis Submitted to Marathwada Agricultural University, Parbhani, Maharashtra, India.
4. Bijurkar, R. J. (1996). Induction of estrous in true anoestrus cross bred Deoni cows by using herbal preparations. M.V.Sc. Thesis Submitted to Marathwada Agricultural University, Parbhani, Maharashtra, India.
5. Das, S., Pradhan, C. R., Mishra, S. K., Swain, R.K., Mishra, P.C., Sahoo, G., Sethy, K., & Chichilichi, B. (2016). Incidence of infertility and biochemical profile of crossbred cows in cuttack district of odisha, india. *Exploratory Animal and Medical Research*, 6 (2), 224-230
6. Hurley, W. L. & Doane, R. M. (1989). Recent developments in the roles of vitamins and minerals in reproduction. *Journal of Dairy Science*, 72, 784-804
7. Sanjib Borah, Prasanta Chabukdhara, Gautam Bordoloi, Sanjib Khargharia, Kanak C Barman, Bikash Borthakur & Ls Khuman, Haematological Profile and Productive Performance of Frizzle Fowl Reared in Subtropical Climatic Condition of Assam, *International Journal of Agricultural Science and Research (IJASR)*, Volume 5, Issue 5, September - October 2015, pp. 147-150
8. Jayachandran, S., Nanjappan, K., Muralidharan, J., Selvaraj, P. & Manoharan, A. (2013). Blood biochemical and mineral status in cyclic and postpartum anoestrus buffaloes. *International J. of Food, Agri. and Vet. Sci.*, 3(1), 93-97
9. Kumar, P. R., Singh, S. K., Kharche, S. D., Govindaraju, C. S., Behera, B. K., Shukla, S. N., Kumar, H. & Agarwal, S. K. (2014). Anoestrus in cattle and buffalo: Indian perspective. *Advances in Animal and Veterinary Science*, 2(3), 124 – 138
10. Kumar, S., & Sharma, M. C. (1991). Level in haemoglobin and certain serum bio-chemical constituents in rural cows during fertile and nonfertile oestrus. *Indian Veterinary Journal*, 68, 361-364
11. Sanjib Khargharia, Gautam Bordoloi, Sanjib Borah, Prasanta Chabukdhara & Uma R. Tamuli, Hybrid Parasitic Load and Haematobiochemical Profile of Cattle Population of Joyhing Area, North Lakhimpur, Assam, *International Journal of Agricultural Science and Research (IJASR)*, Volume 5, Issue 3, May - June 2015, pp. 85-88
12. Niazi, A.A., Khalid, J., Sattar, A. & Haq, A.U. (2003). Comparative studies on plasma profile of calcium, inorganic phosphorus and magnesium in repeat breeder and non cyclic Holstein Friesian and Jersey cows. *Pakistan Journal of Biological Science*, 6, 1139-1141
13. Madan, M. (1979). *Ind. dairyman*. 31: 367. Cited by Naidu, K.V., Rao, A. R. (1982). A study of the etiology of anoestrus in crossbred cows. *Indian Veterinary Journal*, 59, 781-784

14. Mukane, S. M. (1998). *Clinicogynaecological evolution of indigenous drug in induction of oestrous and ovulation in postpartum anoestrus buffloes*. M.V.Sc. Thesis Submitted to Marathwada Agricultural University, Parbhani, Maharashtra, India
15. Pariza, K. F., Alam, J., Islam, M. R., Hossain, M. M. & Awal, M. A. (2013). *Investigation of hematological and biochemical profiles of anoestrus Zebu cows*. *Bangladesh Journal Veterinary Medicine*, 11 (1), 57-60
16. Pugh, D. G., Almore, R. G. & Hembri, T. R. (1985). *Recent advances in animal reproduction and gynaecology*, (edn.) Nanda, A. S. USG Publishers pp. 103-121
17. Ramakrishna, K.V. (1997). *Comparative studies on certain biochemical constituents of anoestrus crossbred Jersey rural cow*. *Indian Journal Animal Reproduction*, 18, 335
18. Ramesh Kumar, S. Nayak, R.P.S. Baghel, Ankur Khare, Manish Dubey & Meenakshi Pateriya1 (2012). *Improvement in blood mineral profile of anoestrus lactating buffaloes through strategic nutrient supplementation*. *Journal of Animal Research*, 2 (3), 307-316
19. Sharad Kumar, Saxena, A. & Ramsagar. (2010). *Comparative studies on metabolic profile of anoestrus and normal cyclic murrah buffaloes*. *Buffalo Bulletin*, 29(1), 7-11
20. Singh, A. S. & Singh, O. N. (2005). *Assessment of haematological and biochemical parameters in crossbred heifers with anoestrus and oestrus*. *Indian Journal Animal Science*, 75(12), 1372-1376
21. Snedecor, G. W. & Cochran, W. G. (1994). *Statistical Methods*, 8<sup>th</sup> edn., The Iowa State University Press, Ames., USA

**Table 1: Haematological and Biochemical Values in Anoestrus Bovine Treated with Polyherbal Drug**

Sl.No	Parameter	Before Treatment	After Treatment	' t' Value
1.	Hb (g/dl)	11.78 ± 0.21	12.39 ± 0.19	3.030 <sup>**</sup>
2.	Calcium (mg/dl)	9.90 ± 0.27	10.44 ± 0.25	2.594 <sup>*</sup>
3.	Phosphorus (mg/dl)	5.08 ± 0.14	5.21 ± 0.14	1.090 <sup>NS</sup>
4.	Glucose (mg/dl)	49.76 ± 1.23	49.91 ± 1.15	0.137 <sup>NS</sup>

NS – Non significant, \* Significant (P<0.05), \*\* Highly Significant (P<0.01)

