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B Sudhakara Reddy

Assistant Professor, Faculty of Veterinary Medicine, Department of Veterinary Clinical Complex College of Veterinary Science, Proddatur, Y.S.R. Kadapa District, Sri Venkateswara Veterinary University, Andhra Pradesh, India

YV Prithvidhar Reddy

Assistant Professor, Department of Veterinary Clinical Complex College of Veterinary Science, Proddatur, Y.S.R. Kadapa District, Sri Venkateswara Veterinary University, Andhra Pradesh, India

S Sivajothi

Assistant Professor, Department of Veterinary Parasitology College of Veterinary Science, Proddatur, Y.S.R. Kadapa District, Sri Venkateswara Veterinary University, Andhra Pradesh, India

S Vani

Assistant Professor, Department of Animal Genetics and Breeding College of Veterinary Science, Proddatur, Y.S.R. Kadapa District, Sri Venkateswara Veterinary University, Andhra Pradesh, India

Kotagiri Ravikanth

Director, Operations and Research, Ayurved Limited Village: Katha, Baddi, Himachal Pradesh, India

Bhaskar Ganguly

Senior Scientist and Head, Clinical Research, Ayurved Limited Village: Katha, Baddi, Himachal Pradesh, India

Correspondence**S Sivajothi**

Assistant Professor, Department of Veterinary Parasitology College of Veterinary Science, Proddatur, Y.S.R. Kadapa District, Sri Venkateswara Veterinary University, Andhra Pradesh, India

Effect of polyherbal preparation (Restobal) supplementation on parturition stress in buffaloes

B Sudhakara Reddy, YV Prithvidhar Reddy, S Sivajothi, S Vani, Kotagiri Ravikanth and Bhaskar Ganguly

Abstract

The present study was designed to evaluate the poly herbal supplementation (Restobal[®], M/s Ayurved Limited) against the management of parturition stress in periparturient buffaloes. Twenty apparently healthy buffaloes at advanced pregnancy were selected and divided into two equal groups. Group I buffaloes (control) were not administered any supplementation and buffaloes under group II (treatment) was administered with oral poly herbal supplementation anti stressors product (Restobal) for the period of five days before and after the parturition. Buffaloes under group II showed the significant changes in clinical parameters and increased levels of packed cell volume, elevation of total leukocyte and lymphocyte count and serum glutathione peroxidase levels and reduced serum cortisol levels when compared with the buffaloes in group I (control). The present study concluded that polyherbal anti stressor product which contains *Ocimum sanctum*, *Phyllanthus emblica*, *Mangifera indica* and *Withania somnifera* (Restobal[®], M/s Ayurved Limited) is recommended in the management of parturition stress during the periparturient buffaloes.

Keywords: Parturition stress, buffaloes, Restobal, management

Introduction

The period from 3 weeks prior to calving to 3 weeks after calving is transition period and it is the most stressful period for the bovines. Most of the diseases may occur during the transition period in bovines (LeBlanc *et al.*, 2006) [4]. Parturition and lactation associated stress increase susceptibility of high producing cows to many infectious diseases during the periparturient period. So, it is necessary to compensate the stress during the transition period (Reddy *et al.*, 2014) [7]. Recent studies showed that improving compromised immune function through supplementation of antioxidant vitamins around parturition can be an alternate approach to reduce the incidence of infectious diseases during a critical periparturient period (Sato, 1998) [9]. In India, several herbs having active principles with antioxidant and antimicrobial properties (Sivajothi *et al.*, 2018a) [12]. The aim of this preliminary study was a scientific validation of indigenous traditional knowledge-based polyherbal preparation containing *Ocimum sanctum*, *Phyllanthus emblica*, *Mangifera indica* and *Withania somnifera* (Restobal[®], M/s Ayurved Limited) during the parturition stress in periparturient buffaloes.

Materials and Methods**Study design**

The present study was carried out at College of Veterinary Science, Proddatur, YSR Kadapa District of Andhra Pradesh. Twenty buffaloes which are in advanced pregnancy were selected and divided equally into two groups. Buffaloes in group I (control) were treated as the control group without any supplementation. Buffaloes in groups II (treatment) were administered with oral polyherbal preparation (Restobal[®], M/s Ayurved Limited @ 50 ml orally BID) one week before the parturition up to one week after parturition.

Clinical examination

Clinical examination was carried out one week before and after the parturition. Buffaloes were examined for the development of the post-parturition complication and changes in the milk production. Blood samples were collected from the buffaloes in both the groups on the 0th day, 3rd day and 5th day of supplementation. The blood sample was divided into two parts and the first part (1 ml) was collected on disodium ethylene diamine tetracetic acid (EDTA) for hemogram. The second part (5 ml) was placed in plain centrifuge tubes for separation of serum and serum samples were stored at -20 °C until used for subsequent biochemical analysis.

Laboratory analysis

Haematological parameters in this study included were an estimation of red blood cell count (RBCs), haemoglobin concentration (Hb), packed cell volume (PCV) and total (TLC) and differential leukocytic counts (DLC). These parameters were done according to the routine haematological procedures as described by Feldman *et al.* (2000) [2]. Serum samples were evaluated for the estimation of serum cortisol according to the test kit. Data were presented as the mean \pm standard error (SE) and were subjected to statistical analysis using one-way analysis of variance (ANOVA) (Sivajothi and Reddy, 2017) [11].

Result and Discussion

Observed clinical, haematological, serum cortisol and glutathione peroxidase levels on the day of parturition, 3rd day and 5th day after parturition were mentioned in table 1 in both the groups of buffaloes. Recorded post parturient complications in control group of buffaloes were metritis (one buffalo, 1/10), retention of the placenta (two buffaloes, 2/10), prolapse of the genitalia (two buffaloes, 2/10), mastitis (one buffalo, 1/10). Recorded post-parturient complications in the treatment group were retention of the placenta (one buffalo, 1/10), prolapse of the genitalia (one buffalo, 1/10), milk fever (one buffalo, 1/10). Changes in the haematological, serum cortisol levels and glutathione peroxidase levels were in association with the previous studies and it is indicative of periparturient buffaloes had a parturition stress (Seifi *et al.*, 2007; Radkowska and Herbut, 2014) [10, 6].

By the 5th day of therapy buffaloes in group II showed the significant variation from the buffaloes in group I by elevation of the packed cell volume, total leukocyte count, lymphocyte count reduced serum cortisol levels. Recorded haematological findings, serum cortisol and glutathione peroxidase levels parameters were suggestive of stress markers and which an indication of the buffaloes had parturition stress and buffaloes in the treatment group showed

the reduced levels of stress (Ingvarsten *et al.*, 2006) [3]. Increased serum cortisol level and reduced glutathione peroxidase levels were noticed during the period of parturition which proved that the parturition process had severe stress in the buffaloes.

The polyherbal product utilized in the present study was Restobal[®] (M/s Ayurved Limited) which contains *Ocimum sanctum*, *Phyllanthus emblica*, *Mangifera indica* and *Withania somnifera*. *Ocimum sanctum* has been used traditionally for the many years in India as stress reliever product. It had effect by regulatory mechanism in the humoral immunity which leads to the antibody production and release of mediators of hypersensitivity which will nonspecific resistance to the organisms (Bathala *et al.*, 2012) [1]. *Phyllanthus emblica* contains polyphenols and these things will protect cell constituents from the oxidative damage by the potent free radical scavengers. It had defensive antioxidant mechanisms and increases the levels of GSH, antioxidant capacity and activities of SOD, CAT, GSH peroxidase, GSH reductase and GSH S-transferase (Saha and Verma, 2015) [8]. *Withania somnifera* is considered as an anti-inflammatory and antioxidant herbal supplement. It shows the antioxidant activity by and regulation of antistress activities via the hypothalamic-pituitary-adrenal (HPA) axis (Mishra *et al.*, 2000) [5]. In previous literature, efficacy of the present herbal product reported as supportive therapy during the vaccination stress in buffaloes (Sivajothi *et al.*, 2018b) [13].

Changes in haemato-biochemical parameters proved that the buffaloes with polyherbal supplementation showed less stress compared with the control group buffaloes. Development of the post-parturient complications was less in the treatment group buffaloes than control buffaloes. The results of this preliminary study suggest that indigenous polyherbal preparation Restobal[®] (M/s Ayurved Limited) can be potentially used as feed additive to reduce the parturition stress through improving the nonspecific immunity of buffaloes.

Table 1: Mean vital, haematological and cortisol levels in buffaloes in group I and II (Mean \pm S.E.)

S. No.	Parameters	0 th Day		3 rd Day		5 th Day		P Value
		Control (Group I) (N=10)	Treatment (Group II) (N=10)	Control (Group I) (N=10)	Control (Group I) (N=10)	Treatment (Group II) (N=10)	Control (Group I) (N=10)	
1	Haemoglobin (g/dl)	9.13 \pm 0.21	9.25 \pm 0.17	9.03 \pm 0.15	9.44 \pm 0.21	9.46 \pm 0.23	9.92 \pm 0.27	0.041 ^{NS}
2	PCV (%)	31.48 \pm 0.76	31.05 \pm 0.92	30.43 \pm 0.87	31.8 \pm 0.75	28.65 \pm 0.91	31.62 \pm 0.64	0.016 [*]
3	TEC x10 ⁶ /cumm	5.42 \pm 0.15	5.39 \pm 0.07	5.37 \pm 0.12	5.31 \pm 0.07	5.27 \pm 0.13	5.53 \pm 0.12	0.178 ^{NS}
4	TLC /cumm	6680.8 \pm 151.8	6606.8 \pm 123.4	6670.4 \pm 141.7	6671.8 \pm 130.0	6210.8 \pm 144.2	6764.6 \pm 113.8	0.006 [*]
5	Neutrophils /cumm	2244.6 \pm 121.92	2206.8 \pm 109.77	2021.3 \pm 90.89	2019.8 \pm 83.60	1912.7 \pm 102.69	2062.6 \pm 99.34	0.703 ^{NS}
6	Lymphocytes /cumm	4094.8 \pm 210.56	3970.4 \pm 144.5	4022.6 \pm 156.48	4022.8 \pm 166.3	3750.8 \pm 209.7	4164.2 \pm 210.54	0.006 [*]
7	Monocytes /cumm	140.3 \pm 40.18	112.3 \pm 32.15	126.7 \pm 28.18	113.4 \pm 29.21	106.6 \pm 41.15	108.2 \pm 38.16	0.660 ^{NS}
8	Eosinophils /cumm	200.4 \pm 34.21	211.39 \pm 62.24	206.8 \pm 31.3	193.4 \pm 19.23	180.1 \pm 27.31	196.4 \pm 21.29	0.616 ^{NS}
9	Basophil /cumm	20.04 \pm 4.15	19.82 \pm 4.16	26.7 \pm 6.36	33.35 \pm 7.16	37.26 \pm 11.15	20.3 \pm 9.15	0.080 ^{NS}
10	Cortisol (nmol/L)	42.46 \pm 2.08	30.40 \pm 0.74	38.16 \pm 1.79	27.78 \pm 0.44	35.96 \pm 1.62	25.56 \pm 0.43	0.000 ^{**}
11	Glutathione peroxidase (u/ml)	31.12 \pm 1.09	34.12 \pm 2.19	29.61 \pm 1.33	36.60 \pm 2.01	26.84 \pm 0.98	37.32 \pm 1.11	0.000 ^{**}
12	Temperature (°F)	100.4 \pm 0.16	100.0 \pm 0.23	100.0 \pm 0.18	100.1 \pm 0.12	101.14 \pm 0.07	100.5 \pm 0.22	0.060 ^{NS}
13	Heart rate	75.8 \pm 1.30	76.1 \pm 1.63	75.6 \pm 1.56	73.7 \pm 1.1	72.7 \pm 1.27	67.1 \pm 1.30	0.007 [*]
14	Pulse rate	75.1 \pm 1.35	75.0 \pm 1.37	74.9 \pm 1.64	73.0 \pm 1.02	72.5 \pm 1.3	67.1 \pm 1.32	0.009 [*]
15	Respiratory rate	21.3 \pm 0.42	22.7 \pm 0.67	19.1 \pm 0.57	20.1 \pm 0.73	19.1 \pm 0.53	18.7 \pm 0.60	0.627 ^{NS}

NS: Statistically Not Significant ($P > 0.05$); *: Statistically Significant ($P \leq 0.05$); **: Statistically Highly Significant ($P \leq 0.01$)

Conclusion

In conclusion, herbal anti stressor product Restobal[®] (M/s Ayurved Limited) is recommended as a therapy for the parturition stress.

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