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Research Article

HAEMATO-BIOCHEMICAL PROFILE AND CONTROL OF PESTE DES PETITS RUMINANT IN GOATS USING LEVAMISOLE AND METRONIDAZOLE

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ABSTRACT

An outbreak of Peste des petits ruminant (PPR) in an unorganised farm was recorded in Beltola area of Guwahati, Assam. Symptoms of high fever (106ºF), anorexia, lacrimation, severe diarrhoea, reluctant to move on account of abdominal pain and cramping were recorded in affected goats (n=15) with morbidity and mortality rates of 100 and 20 per cent, respectively. The animals recovered in 5 days post treatment with an overall recovery rate of 87 per cent. Antibodies against PPR virus were determined with the help of competitive enzyme linked immunosorbent assay technique (c-ELISA). PPR positive blood and serum samples (n=7) as well as control (n=7) were subjected to complete blood count and biochemical tests. Haematological parameters revealed a significant decrease ($p<0.05$) in the mean Hb and RBC values whereas significant increase ($p<0.05$) in the mean WBC and PCV values in PPR infected goats in comparison to that of control group. Biochemical parameters, showed significant ($p<0.05$) increase in the mean creatinine, total bilirubin and BUN values. Treatment initiated with a single dose of levamisole @ 2.5 mg/ kg body wt. subcutaneously and metronidazoles @ 10 mg / kg body wt. intravenously once daily for 5 days lead to uneventful recovery.

INTRODUCTION

Peste des petits ruminant (PPR) commonly called as plague of small ruminants is an emerging, economically important transboundary viral disease of sheep and goats. It is an acute febrile and highly contagious disease of goat and sheep characterised by mucopurulent oculo-nasal discharges, ulcerative stomatitis, enteritis and pneumonia (Das *et al.* 2015). In India, PPR was first recorded in 1987 from Tamil Nadu (Shaila *et al*., 1989). Later, numbers of PPR outbreaks were reported from neighbouring states of Rajasthan and Karnataka and from the northern states of India by Nanda *et al*., (1996). The disease is endemic in India and causes great economic losses each year due to the high morbidity and mortality rates ranging between 50% to 100% and 90% to 100% in goats (Kumar *et al*., 2001; Lefevre *et al.,* 1991). Severity of the disease is more pronounced in goats than in sheep (Reoder *et al*., 1988). In India, the disease occurs throughout the year, thus it is one of the major threats to the small ruminant production for the country.

MATERIALS AND METHOD

Case History and Observation

A herd consisting of 15 goats including 4 pregnant and 2 lactating does, 3 bucks and 6 kids exhibiting high fever, severe bloody diarrhoea emitting foul smell, oculo-nasal discharge, depression, bleating, reluctance to move, drooping head, pasty eyes and sudden decrease in appetite due to ulcerated lesions on the oral cavity, eyes and nostrils were brought to the Teaching Veterinary Clinical Complex (TVCC), College of Veterinary Science Khanapara-22. As reported by the owner there was no history of any vaccination in the flock.

Serology

The serum samples were sent to the Institute for Animal Health Centre, North Eastern Regional Disease Diagnostic Laboratory (NERDDL), Khanapara, Guwahati, Assam. All the samples were found to be positive for PPR with the help of competitive enzyme linked immunosorbent assay technique (c-ELISA).

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Haematology and Biochemical Analysis

Haematological parameter were studied to estimate total red blood cell (RBCs), packed cell volume (PCV), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC), total white blood cell (WBCs), lymphocyte, haemoglobin (Hb) and thrombocyte using automatic haematology cell counter, while the biochemical parameters such as creatinine, serum bilirubin, blood urea nitrogen (BUN), direct bilirubin and total bilirubin were estimated by semi-automated serum analyser.

Statistical Analysis

The results of haemato-biochemical parameters between infected (n=7) and apparently healthy (n=7) animals were compared using SPSS software. The results presented as mean with the standard error and p-value <0.05 was considered significant.

RESULTS

Haematological estimation result revealed significant differences in some of the parameters obtained between infected (n=7) and control group (n=7). Low values of Hb, RBC, PCV, MCHC and MCH counts were recorded in PPR infected group in comparison to that of control group. However, Hb and RBC showed a significant ($p<0.05$) decrease whereas PCV, WBC count were significantly ($p<0.05$) higher (Table 1). Biochemical analysis showed a significant ($p<0.05$) increase in serum creatinine, BUN and bilirubin in the infected goats (Table 2).

Table 1 Haematological parameters in PPR infected and control group

Variables	PPR infected group (n=7)	Control group (n=7)
	Mean ± SE	Mean ± SE
Hb(gm/dl)	7.24±0.19*	8.12±0.17*
RBC (x1012/ l)	12.17±0.30*	15.24±0.49*
PCV (%)	26.36±0.28*	21.73±0.67*
MCH(pg)	4.34±0.12	4.51±0.14
MCHC(g/dl)	37.02±0.37	37.63±0.18
MCV(fl)	17.47±0.11	18.44±0.32
WBC (M/mm3)	18.20±0.10*	11.28±1.06*
Lymphocyte (%)	51.67±0.22	50.24±0.44
Monocyte (%)	4.66±0.19	4.05±0.38
Thrombocyte(M/mm3)	336.86±6.83	350.43±5.89

Table 2 Biochemical Parameters in PPR Infected and control group.

Variables	PPR infected group (n=7)	Control group (n=7)
	Mean ± SE	Mean ± SE
Creatinine(mg/dl)	2.12±0.06*	1.06±0.078*
BUN(mg/dl)	15.41±0.12*	13.637±0.372*
Total Bilirubin(mg/dl)	0.30±0.01*	0.166±0.026*
Direct bilirubin(mg/dl)	0.13±0.002	0.09±0.02

Mean with asterisk indicates significant difference between rows ($P<0.05$)

TREATMENT AND DISCUSSION

Treatment was initiated with Levamisole @ 2.5mg/kg body wt. subcutaneously single shot on day 1 followed by Metronidazole @10mg/kg body wt. intravenously once daily for a period of 5 days as needed for combating secondary bacterial and protozoal infection causing enteritis. Normal saline was administered @ 20 ml/kg body wgt.12 hrly for rehydration along with Vitamin B complex and antipyretic as supportive therapy. Regular washing of the mouth having ulcerated lesion with KMnO4 and application of boroglycerine lotion was advised. Overall therapeutic survivability/recovery rate of 87.00 per cent achieved in this study was superior to the findings of Anene *et al*., (1987) and Islam *et al*., (2003) who reported recovery rate of 14.29 per cent and 68.75 per cent respectively. Moreover the 3 pregnant does that were in advanced pregnancy gave birth to healthy kids. Higher recovery rate of 93.23 per cent was reported by Yousuf *et al*., (2015) using metronidazole along with PPRV specific hyper immune serum in PPR infected subjects. In the present study, levamisole used as synthetic immunomodulator, might have altered both non-specific and specific immune response restoring the cell-mediated immune function in peripheral T lymphocytes and there by accelerating phagocytosis. Similar study were also conducted by Das *et al*., (2014) and Talabi *et al*., (2002) who stated higher survivability rate in PPR infected goats when levamisole was used along with other antibiotics. Corneal opacity was reported in some of the goats during convalescent period which was simply cured by administrating single subconjunctival injection of gentamicin and corticosteroid. Haemato-biochemical results obtained in the present study were similar to the findings of Sharma *et al*., (2012) except in PCV values which were higher in infected group. The higher PCV value obtained may be on account of dehydration and diarrhoeic status leading to haemoconcentration in the infected animals.

CONCLUSION

PPR is a major constraint in small ruminant production incurring huge economic losses in terms of morbidity, mortality and productivity losses with trade restriction. Although a good therapeutic survivability rate of 87 per cent was achieved using Metronidazole and levamisole in the present study without any complicacy. Further studies are needed to be carried out regarding the margin of safety, residual effect and efficacy of this drug in therapeutic management of PPR in small ruminants.

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