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Haematobiochemical and rumen liquor alterations in buffaloes affected with ruminal indigestion and foreign body syndrome

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Abstract

The clinical research was conducted in three groups comprising 32 buffaloes presented to Veterinary College, Bidar. In group I (13) healthy buffaloes, group II (13) buffaloes with ruminal indigestion and group III (6) buffaloes with foreign body syndrome (FBS) were evaluated. Haematobiochemical examination was carried out to evaluate parameters viz. Haemoglobin, Packed Cell Volume, Total leucocyte count, Total erythrocyte count, Differential leucocyte count, Total protein, Aspartate aminotransferase, Calcium and phosphorous whereas in rumen liquor parameters namely pH, microflora density/field and microflora motility were evaluated in buffaloes. Haematobiochemical examination revealed non-significant changes in Haemoglobin, PCV, TEC and Eosinophils in group II and group III buffaloes. Significant increased total leucocyte count, neutrophil count and decreased lymphocyte count in group III buffaloes was observed. In group II buffaloes significant decreased total protein was observed. Significant increased aspartate aminotransferase, decreased calcium and phosphorous values were observed in group II and III buffaloes. Rumen liquor examination revealed increased pH to 8.01 ± 0.22 and 7.58 ± 0.28 in buffaloes of group II and III respectively whereas decreased microflora motility and density/field was observed.

Keywords: Buffalo, indigestion, foreign body, haematobiochemical, rumen liquor

Introduction

The unselective feeding nature of buffaloes and cows results in consumption of foreign bodies and these foreign body lodges into the reticulum and produces reticular disorders like traumatic reticuloperitonitis (TRP), acute periarticular inflammation, adhesions and abscess (Abdelaal *et al.*, 2009) [1]. These affected ruminants on clinical examinations are initially diagnosed with chronic ruminal indigestion. However haematobiochemical and rumen fluid examination is also utmost essential to know the status of ruminal ecosystem and thereby confirming forestomach disorders (Radostits *et al.*, 2007) [7]. Therefore present study was carried out with the objectives of haematobiochemical and rumen liquor in healthy and compared with buffaloes affected with ruminal indigestion and FBS.

Materials and Methods

The clinical study was carried out in three groups comprising of 32 buffaloes presented to the Veterinary College, Bidar. The group I include 13 healthy buffaloes and treated as control. Whereas group II (13 no.) and III (6 no.) consist of buffaloes affected with ruminal indigestion and FBS respectively.

Six mL of blood was collected aseptically from jugular vein in Ethylenediamine tetraacetic acid (EDTA tubes) and clot activator tubes. The EDTA and serum clot activator tubes were preserved at 4 °C and -40 °C respectively. Haematological examination was carried out to evaluate haemoglobin, packed cell volume, total erythrocyte count, total leucocyte count and differential leucocyte count (Jain, 2000) [5]. Biochemical examination was carried out for evaluation of total protein, aspartate aminotransferase, serum calcium and serum phosphorous. Around 3-5 mL of rumen liquor was collected aseptically from left flank (Rumenocentesis) using sterile syringe and needle towards rumen. Rumen liquor was collected and evaluated for pH using pH meter (Radostits *et al.*, 2007) [7], presence or absence of ruminal microflora, density of microflora per field and motility of microflora was assessed as sluggish and amotile

microflora (Sharma *et al.*, 2009) [9]. The research data were evaluated by student t-test (Snedecor and Cochran 1994) [10].

Results and discussion

Haemoglobin, PCV, Total erythrocyte count and eosinophils were non-significant in group II and group III when compared to group I buffaloes. The total leucocyte count was non-significantly increased in group II whereas, significantly increased at ($p \leq 0.05$) in group III when compared to group I buffaloes. This was in agreement with the findings in bovines affected with FBS and they attributed due to localized infection and inflammatory conditions of rumen and reticulum (Rajput *et al.*, 2018) [8]. Lymphocytes were non-significantly decreased and significantly decreased ($p \leq 0.01$) in group II and group III respectively when compared to group I buffaloes. The decreased lymphocytes might be due to reduced cellular immunity in bovines under stress condition (Radostits *et al.*, 2007) [7]. Neutrophils were non-significantly increased and significantly increased ($p \leq 0.01$) in group II and III respectively when compared to group I buffaloes. The increased neutrophils due to presence of tissue injury by foreign body in the forestomach thereby resulted in

production of purulent exudates and were absorbed into the blood and lymph channels lead to the intoxication (Rajput *et al.*, 2018) [8].

Total protein was significantly decreased at ($p \leq 0.05$) in group II and non-significant decreased in group III when compared to group I buffaloes. Similar decreased total protein were recorded in buffaloes affected with indigestion and opined that liver insufficiency resulted in low levels of protein and calcium lead to rumen dysfunction (Padmaja and Rao, 2012) [6]. Aspartate aminotransferase was significantly increased at ($p \leq 0.01$) in group II and III when compared to group I buffaloes. Similar findings were recorded in bovines and increased AST levels due to the inflammation and cellular destruction caused by ingested foreign body (Padmaja and Rao, 2012; Rajput *et al.*, 2018) [6, 8]. Calcium and phosphorous values were significantly decreased in group II and III when compared to group I buffaloes. Similar observation were recorded in buffaloes and cattle due to dietary deficiency and failure of calcium absorption in reduced rumen motility and deficiency of minerals and vitamins (Padmaja and Rao, 2012; Fani *et al.*, 2019) [6, 4]. The haematobiochemical parameters are given in Table 1.

Table 1: Mean \pm SE values of Haematobiochemical parameters in group I, II and III buffaloes

Sl. no	Haematobiochemical parameters	Group I	Group II	Group III
1	Haemoglobin (g/dL)	11.23 \pm 0.28	10.51 \pm 0.56	11.03 \pm 1.20
2	Packed Cell Volume (%)	38.32 \pm 1.27	37.71 \pm 2.38	36.67 \pm 3.12
3	Total leucocyte count ($10^3/\mu\text{L}$)	10.02 \pm 0.30	10.64 \pm 0.97	13.30 \pm 2.56*
4	Total erythrocyte count ($\times 10^6/\mu\text{L}$)	6.90 \pm 0.27	7.40 \pm 0.60	6.37 \pm 0.47
5	Lymphocytes (%)	62.92 \pm 0.62	56.31 \pm 3.83	44.17 \pm 5.01**
6	Neutrophils (%)	34.38 \pm 0.66	41.46 \pm 3.89	54.50 \pm 5.09**
7	Monocytes (%)	1.85 \pm 0.21	1.38 \pm 0.26	0.83 \pm 0.15**
8	Eosinophils (%)	0.85 \pm 0.15	0.85 \pm 0.15	0.83 \pm 0.15
9	Total protein (g/dL)	7.12 \pm 0.14	5.97 \pm 0.49*	6.45 \pm 0.48
10	Aspartate aminotransferase (U/L)	65.99 \pm 4.68	195.23 \pm 24.93**	241.50 \pm 41.69**
11	Calcium (mg/dL)	9.64 \pm 0.23	6.22 \pm 0.76**	7.44 \pm 1.38*
12	Phosphorous (mg/dL)	5.94 \pm 0.09	4.57 \pm 0.48*	4.15 \pm 0.78**

Mean values bearing superscript* differ significantly at ($p \leq 0.05$) between the groups

Mean values bearing superscript** differ significantly at ($p \leq 0.01$) between the groups

The pH of rumen liquor was significantly increased at ($p \leq 0.01$) in group II and at ($p \leq 0.05$) in group III when compared to group I buffaloes. Similar findings were recorded in buffaloes affected with indigestion (Akraiem and Asa, 2016) [11] and increased pH due to putrefaction of protein in rumen (Radostits *et al.*, 2007) [7]. Microflora density was significantly decreased at ($p \leq 0.01$) in group II and III when compared to group I buffaloes. The decreased microflora

density were recorded in bovines (Boodur *et al.*, 2010) [3] and decreased microflora attributed to changes in rumen pH leads to death of microflora (Radostits *et al.*, 2007) [7]. Microflora motility in buffaloes of group II and III were sluggish and amotile when compared to group I buffaloes. Similar reduced microflora motility were observed in bovines (Boodur *et al.*, 2010) [3]. Rumen liquor parameters are given in Table 2.

Table 2: Mean \pm SE values of rumen liquor parameters in group I, II and III buffaloes

Sl.no	Rumen liquor parameters	Group I	Group II	Group III
1	pH of rumen liquor	7.09 \pm 0.03	8.01 \pm 0.22**	7.58 \pm 0.28*
2	Microflora density/field	25.00 \pm 0.94	5.69 \pm 1.12**	9.00 \pm 1.57**

Mean values bearing superscript* differ significantly at ($p \leq 0.05$) between the groups

Mean values bearing superscript** differ significantly at ($p \leq 0.01$) between the groups

Conclusion

The clinical research was conducted and evaluated for haematobiochemical and rumen liquor in buffaloes affected with ruminal indigestion and foreign body syndrome (FBS). Significant increased total leucocyte count, neutrophil count and decreased lymphocyte count in group III buffaloes affected with foreign body syndrome was observed. These significant changes in the haematobiochemical parameters suggestive of chronic infection and inflammatory changes

observed in the group III buffaloes. Whereas in group II buffaloes only significant decreased total protein was observed. However, Significant increased aspartate aminotransferase, decreased calcium and phosphorous values were observed in buffaloes of both the group II and III when compared to group I. Significant increased in the aspartate aminotransferase, decreased calcium and phosphorous value suggestive of chronic anorexia, indigestion and presence of infection in buffaloes of group II and III. In rumen liquor

examination showed significant increased pH up to 8.01 ± 0.22 and 7.58 ± 0.28 in buffaloes of group II and III respectively. Whereas significant decreased motility of microflora and density/field were observed in buffaloes of group II and III. Significant increased pH, decreased microflora and density of rumen liquor also suggestive of changes in the rumen ecosystem and which results in the indigestion. So in conclusion it is very much essential to know the impact of overall evaluation of animals to assess the ongoing changes with respect to each disorder and thereby it helps in giving proper treatment according to the need of animals.

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References

1. Abdelaal AM, Floeck M, El Maghawry S, Baumgartner W. Clinical and ultrasonographic differences between cattle and buffaloes with various sequelae of traumatic reticuloperitonitis. *Vet Med (Praha)*. 2009;54(9):399-406.
2. ASA, AAG. Rumen impaction in cattle due to plastic materials. *J Vet. Med. Res.* 2016;23(1):9-14.
3. Boodur P, Shivaprakash BV, Kasaralikal VR, Dilipkumar D. Rumen impaction in bovines with indigestible foreign bodies and its surgical and therapeutic management. *Intas Polivet*. 2010;11(2):184-188.
4. Fani F, Thorat MG, Upadhye SV, Kuralkar SV, Waghmare SP, Dhore RN. Clinico-physiological and haemato-biochemical alterations in non-penetrating foreign body syndrome with reference to the percentage of plastic in cattle. *Int. J sci. environ. technol.* 2019;8(4):882-895.
5. Jain NC. *Schalm's Veterinary Hematology*. Edn 5, Lea and Febiger Publisher, Philadelphia, USA, 2000, 1.
6. Padmaja K, Rao DST. Biochemical and therapeutic studies on post-parturient indigestion (PPI) with particular reference to hepatic insufficiency in buffaloes. *Inter. J Pharma Biosci.* 2012;3:40-45.
7. Radostits OM, Gay CC, Hinchcliff KW, Constable PD. A textbook of the diseases of cattle, horses, sheep, pigs and goats. *Veterinary medicine*. 2007;10:2045-2050.
8. Rajput PK, Parikh PV, Parmar JJ, Mehta TA, Patil DB. Studies on foreign body syndrome in bovines of Anand district of Gujarat. *Indian J Anim. Res.* 2018;52(5):744-749.
9. Sharma MC, Kumar M, Sharma RD. *Textbook of clinical veterinary medicine*, Indian Council of Agricultural Research, New Delhi, 2009.
10. Snedecor GW, Cochran WG. *Statistical Methods*, Affiliated East-West Press Pvt Ltd, New Delhi, 1994.
11. Akraiem A, Abd Al-Galil ASA. Rumen impaction in cattle due to plastic materials. *Journal of Veterinary Medical Research*. 2016;23(1):9-14.