

Serum proteins in endometritis affected buffaloes

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Abstract

Present study was undertaken to compare the serum proteins of healthy buffaloes with that of buffaloes affected with endometritis. Serum samples from ten buffaloes that were affected with endometritis and from ten healthy buffaloes were collected from the villages of Bodhan Mandal, Nizamabad Dist., Telangana State. The collected serum samples were analysed for serum total proteins, albumins, globulins and A/G ratio. The results showed that the concentrations of serum total proteins and albumin were significantly lower ($P<0.05$) in the animals affected with endometritis compared to the healthy buffaloes, whereas the serum globulin concentration and the A/G ratio were significantly higher ($P<0.05$) in the affected animals. These serum protein concentrations may be attributed to the deleterious effects of endometritis on the health of the animal.

Keywords: Endometritis; buffaloes; serum proteins

Introduction

Water buffalo shares a significant portion among global milk production as it is the major contributor of milk in many countries (FAO, 2018). India stands first in the world for buffalo population as well as for buffalo milk production (Borghese, 2005). Since optimum milk production depends on the sound reproductive health of the buffaloes, any uterine infections have negative impact on economics of milk production. Endometritis is the major disorder of the reproductive system of buffaloes that causes serious economic losses to the farmers (Bajaj *et al.*, 2016). Postpartum uterine discharges serve as a medium for bacterial growth if not evacuated which leads to endometritis (Seals *et al.*, 2002). Serum protein concentrations in the endometritis affected buffaloes of this area may help in further studies which may help in diagnosing the endometritis at an early stage and also in identifying septicemia resulting from endometritis. The effect of endometritis on the serum protein status was studied in the present study since there were no proper studies on this in this particular region. The present study is to establish the basic facts on which further studies can be conducted.

Materials and Methods

Collection of samples Buffaloes from the Bodhan mandal villages of Nizamabad district in Telangana state were per rectally examined for presence of endometritis as the buffaloes of these places were exhibiting repeat breeding and showing signs including pus discharges, tubularity of the horns and few animals showing curling of horns. After per rectal examination of the buffaloes, blood samples were collected from the endometritis positive and healthy buffaloes, ten each. All the animals involved in the study are from different farmers (small and marginal) of the nearby villages. The buffaloes under this study were all Graded Murrah buffaloes and of different parities ranging from primiparous to pleuriparous animals. The samples were collected into fresh vials following aseptic measures and serum was extracted from the blood samples collected. The vials with serum samples thus collected were transported to the laboratory on ice and were kept under refrigeration.

Analysis The serum samples from both the groups were analyzed for Serum Total Proteins, Serum Albumin and Serum Globulins using Erba Chem-7 semi-automatic biochemistry analyzer as per manufacturer's instructions using Erba kits.

Statistical Analysis The concentrations of the serum Total Protein, Serum Albumin and Serum Globulins were statistically analysed for Paired T Test (Snedecor and Cochran, 1994) using Graph Pad Prism software.

Results and Discussion

The results obtained are tabulated in the Table 1 and depicted in the Fig 1

Serum Total Proteins The serum total protein concentration of the buffaloes affected with endometritis (64.55 ± 0.541 g/L) were significantly lower ($P < 0.05$) than that of the healthy buffaloes (71.54 ± 0.453 g/L).

Serum Albumin The serum albumin concentration of the endometritic buffaloes was found to be 29.29 ± 0.469 g/L which was significantly lower ($P < 0.05$) to the serum albumin concentrations of the healthy buffaloes (34.46 ± 0.348 g/L). Serum albumin concentrations and thereby the serum total protein concentrations were lowered in the endometritic buffaloes attributed to decrease in the serum albumin concentrations. Serum albumin is a negative acute phase protein which decreases in concentration during acute inflammations. Since endometritis is an acute inflammation of the endometrium, the serum albumin concentration decreases markedly in the endometritic buffaloes when compared to healthy buffaloes. This explanation is in accordance with the findings of Van Sun (2004) and Bertoni *et al.* (2008).

Serum Globulins The serum globulin concentration of endometritis affected buffaloes (32.3 ± 0.537 g/L) were found to be significantly higher ($P < 0.05$) to that of the healthy buffaloes (27.6 ± 0.426 g/L). The significant increase in the serum globulins in the affected buffaloes is due to the increase of immunoglobulins in the circulating blood in response to the infection as also stated by Kojima (1959) in his work.

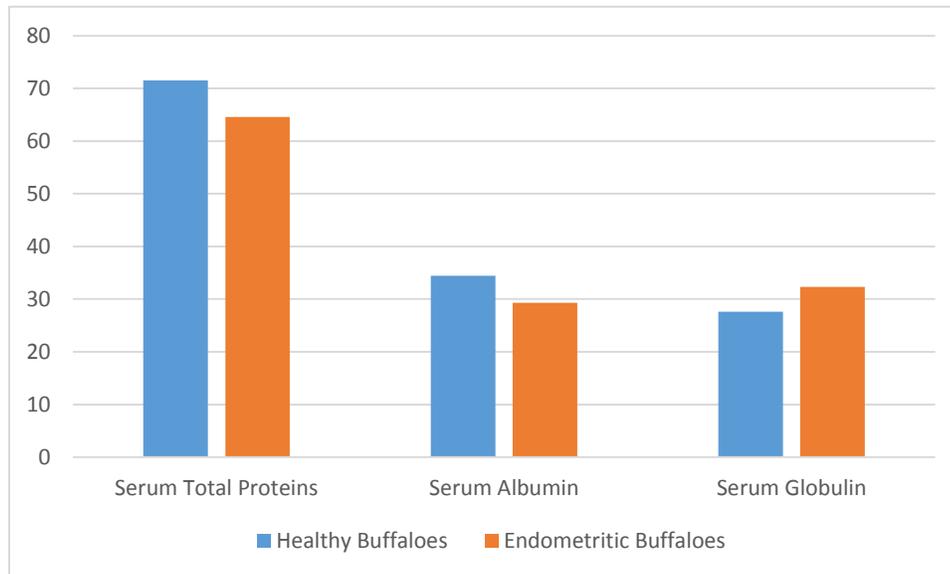
Serum A/G ratio

Serum A/G ratio was arrived at, by mathematically calculating the ratio of serum albumin to serum globulin. The A/G ratio of the endometritis suffering buffaloes (0.907 ± 0.014) was significantly lower ($P < 0.05$) to that of healthy buffaloes (1.252 ± 0.028). Since the numerator serum albumin is lowered and the denominator serum globulin is increased, the A/G ration of the endometritic buffaloes is significantly reduced compared to the healthy buffaloes.

Table 1: Mean \pm S.E of Serum Proteins of Healthy and Endometritis affected Buffaloes

S.No.	Serum Protein	Healthy Buffaloes	Endometritis affected Buffaloes
1	Total Protein (g/L)	71.54 \pm 0.453 ^a	64.55 \pm 0.541 ^b
2	Albumin (g/L)	34.46 \pm 0.348 ^a	29.29 \pm 0.469 ^b
3	Globulin (g/L)	27.6 \pm 0.426 ^a	32.3 \pm 0.537 ^b
4	A/G ratio	1.252 \pm 0.028 ^a	0.907 \pm 0.014 ^b

Values bearing a or b are significantly different at P < 0.05.

Fig. 1: Serum proteins in healthy and endometritis affected buffaloes

Conclusion Since in many cases of endometritis in buffaloes the clinical signs may not be prominent, the per-rectal examination along with the serum protein analysis which varies significantly from the healthy group of buffaloes, can be taken into consideration for accurate diagnosis of the endometritis in buffaloes.

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