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Short Communication

BIOCHEMICAL PROFILE OF BUFFALOES SUFFERING FROM FOREIGN BODY SYNDROME

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SUMMARY

A study was conducted to determine the variations in concentrations of blood glucose, total protein, cholesterol and blood urea nitrogen (BUN) in buffaloes (n=30) suffering from foreign body syndrome. These animals were subdivided into two groups showing traumatic reticuloperitonitis (TRP, n=20) and diaphragmatic hernia (DH, n=10). Six healthy female buffaloes of same age group were considered as control. Concentrations of cholesterol and total plasma were significantly lower in foreign body syndrome-affected buffaloes. However, no significant difference was observed between DH- and TRP-affected buffaloes. BUN concentration was significantly higher in foreign body syndrome affected animals and was more marked in DH (43%) affected buffaloes as compared to buffaloes suffering from TRP (25%). Blood glucose concentration in foreign body syndrome-affected buffaloes was comparable to control group.

Key words: Biochemical profile, buffalo, foreign body syndrome

The foreign body syndrome (FBS) is a common and complicated disease of gastrointestinal tract in ruminants and its incidence appears to be higher in buffaloes than cattle. These animals ingest foreign bodies such as nails, wires, needles etc. due to indiscriminate feeding habits. FBS is clinically characterized by sudden anorexia, mild fever, ruminal stasis and abdominal pain, poor milk yield, loss of body weight, reduced reproductive ability and death resulting in heavy economic loss to farmers. The biochemical parameters not only help in diagnosis of clinicopathological conditions but also provide enough indications about prognosis of FBS (Kaur and Singh, 1994). Hence, the present study was undertaken to determine certain biochemical parameters in FBS-affected buffaloes.

The present study was conducted on thirty female adult buffaloes brought to the Teaching Veterinary Clinical Complex of the University for disease diagnosis and later on diagnosed as cases of FBS. Clinical symptoms included chronic tympany, anorexia, indigestion, suspended rumination and fall in milk yield. The presence of foreign bodies in reticulum and other body parts was confirmed by radiographical examination and laparo-rumenotomy. Depending upon the clinical condition and radiographic evidences, these animals were sub-divided into two groups of traumatic reticuloperitonitis (TRP, n=20) and diaphragmatic hernia (DH, n=10). Blood samples were collected from these animals via jugular venipuncture in EDTA for biochemical analysis. Blood glucose was immediately estimated after preparation of protein free filtrate by the method of Folin and Wu (1920). Estimation of other biochemical parameters was done according to the standard methods i.e. total protein (Reinhold, 1953), cholesterol (Zak, 1957) and blood urea nitrogen (BUN; Wotten, 1964). Means and standard errors were calculated and the data was subjected to Fischer's t-test (Snedecor and Cochran, 1967).

There was no significant difference in blood glucose concentrations between buffaloes of FBS-affected and control group (Table 1). The buffaloes suffering from FBS in the present study had blood glucose level comparable to the apparently healthy buffaloes inspite of significant reduction in their feed intake suggesting a shift in their carbohydrate metabolism. Enhanced gluconeogenesis could probably be a contributing factor for maintaining blood glucose level in diseased animals under the influence of higher circulatory levels of cortisol in these diseased buffaloes (Singh *et al.,* 2005).

The concentration of cholesterol was significantly lower in FBS buffaloes as compared to controls (Table 1). This observation is in accordance with the earlier observation in bovines affected with DH (Behl *et al.*, 1987) and TRP (Gokce *et al.,* 2004). However, cholesterol

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Table 1
Plasma concentration (mean±S.E.) of various metabolites in foreign body syndrome affected animals

Biochemical parameters	Glucose (mg/dl)	Cholesterol (mg/dl)	Urea (mg/dl)	Total protein (g %)
Control	44.17[a]±1.18	203.18[a]±4.01	24.95[a]±0.87	9.68[a]±0.37
FBS	46.82[a]±0.93	114.87[b]±3.01	32.64[b]±0.63	7.7[b]±0.15
I. TRP	46.49±1.17	116.11±3.89	31.15[a]±0.60	8.13±0.18
II. DH	47.49±1.58	112.40±4.74	35.61[b]±0.92	7.56±0.22

Values with different superscripts within a column differ significantly ($P<0.01$)

concentration observed in buffaloes by Kaur and Singh (1994) are contradictory, where a significant increase was observed in DH and FBS-affected animals. Enhanced utilization of cholesterol in these animals for synthesis of higher amount of cortisol as evidenced by significantly higher concentration of plasma cortisol (Singh *et al.,* 2005) in FBS-affected animals as compared to apparently healthy buffaloes might be another reason for hypocholesterolemia. The concentration of plasma cholesterol did not differ significantly between animals affected with DH and TRP (Table 1) which is in contrary to the finding of Kaur and Singh (1994), where significantly higher levels of cholesterol were observed in DH-affected buffaloes as compared to buffaloes suffering from other sequelae of the FBS.

The concentration of BUN was significantly higher in buffaloes suffering from FBS as compared to controls (Table 1) as also reported by Behl *et al.* (1997). This could partly be attributed to the degenerative and necrotic changes in the kidneys associated with the disease (Kaur and Singh, 1994) which might had reduced urea clearance by the renal tubules resulting into higher concentrations of BUN in FBS-affected buffaloes. Total proteins were significantly lower in buffaloes suffering from FBS as compared to control group (Table 1) which corroborates with the findings of Mehta *et al.* (1988) and Kaur and Singh (1994). In contrast, higher values of total protein had been reported in bovines affected with TRP (Gokce *et al.,* 2004). The significant decrease could be due to lack of proper diet associated with anorexia or poor absorption. The progressive loss of appetite and reduced feed and water intake associated with recurrent tympany observed in these buffaloes could also explain hypoproteinemia in FBS-affected animals. The data revealed no difference in the total proteins in TRP-affected buffaloes and animals suffering from DH.

The detection of significant changes in concentration of cholesterol, BUN and total protein indicated massive intermediary metabolic stress in FBS cases that needs to be addressed in planning constituents of fluid therapy.

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