

PERIPHERAL CONCENTRATION OF THYROID HORMONES IN BUFFALOES SUFFERING FROM FOREIGN BODY SYNDROME

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SUMMARY

A study was conducted to investigate the variation in peripheral blood concentrations of thyroid hormones (T_3 and T_4) in thirty clinical cases of buffaloes suffering from foreign body syndrome (FBS). The peripheral concentration of thyroid hormones (T_3 and T_4) was significantly lower in animals suffering from FBS as compared to apparently healthy buffaloes. The decrease in T_3 and T_4 levels in plasma were more marked in buffaloes suffering from diaphragmatic hernia (87%, 66 %) as compared to traumatic reticuloperitonitis (57%, 48%).

Key words: Buffalo, thyroid hormone, foreign body syndrome, diaphragmatic hernia

The foreign body syndrome (FBS) is the manifestation of lesions and maladies caused by the ingested foreign bodies. The FBS is clinically characterized by progressive weakness, reduced milk yield, variable appetite to complete in appetency, mild fever, ruminal stasis with pain in abdomen, loss of body weight and death. The anorexia associated with FBS puts great metabolic stress on animal. Peripheral concentrations of T_3 and T_4 represent the basal metabolic rate of animal. Hence, the estimation of blood level of thyroid hormones (T_3 and T_4) is of great importance (Garg *et al.*, 1999). The present investigation presents the T_3 and T_4 hormone profiles in plasma of buffaloes suffering with FBS.

Thirty adult buffaloes ranging in age group between four to eight years brought to Teaching Veterinary Clinical Service Complex of University were diagnosed on the basis of clinical symptoms, radiographical examination and laparorumenotomy. Animals in diseased group suffered from traumatic reticuloperitonitis (TRP, n=20) and diaphragmatic hernia (DH, n=10). The blood plasma was separated by centrifuging the whole blood mixed with EDTA at 3000 rpm for 20 min. and was preserved at -20°C till analysis. The six apparently healthy female buffaloes of

same age group were considered as control. Peripheral thyroid hormones (T_3 and T_4) concentrations were determined by radio immunoassay using RIA kits supplied by Bhabha Atomic Research Centre, Mumbai, India and assay was conducted as per supplied protocol with kit. The means and standard errors were calculated as, per standard procedure. The data was subjected to Fischer's t-test (Snedecor and Cochran, 1967).

The peripheral concentration of the triiodothyronine (T_3) was significantly lower in buffaloes suffering from foreign body syndrome as compared to the apparently healthy animals (Table 1) which is in accordance with Garg *et al.*, (1999). A positive correlation between anorexia and reduced secretion rate of triiodothyronine (T_3) was reported in ruminants (Naqvi *et al.*, 1991, Garg *et al.*, 1997, Garg *et al.*, 1999). Therefore, lower concentration of triiodothyronine (T_3) in buffaloes suffering from FBS could be due to prevailing anorexic condition in these diseased animals. Higher circulatory levels of cortisol in FBS associated animals (Singh *et al.*, 2005) could also partly be responsible for significantly lower peripheral concentrations of T_3 due to inhibitory effect of higher circulatory cortisol on the release of TSH which control the release of T_3 from thyroid gland (Nathanielsz *et al.*, 1973, Ganong *et al.*, 2007). The statistical

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Table 1
Plasma concentrations (ng/ml \pm S.E.) of thyroid hormones (T_3 and T_4) in buffaloes suffering from foreign body syndrome

Group of Animals	Plasma thyroid hormone level	
	T_3	T_4
Control	1.27 ^a \pm 0.03	59.57 ^a \pm 1.53
Diseased (FBS)	0.43 ^b \pm 0.07	26.93 ^b \pm 2.73
I. TRP	0.55 ^a \pm 0.09	30.83 ^a \pm 3.81
II. DH	0.17 ^b \pm 0.07	20.15 ^b \pm 3.05

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

analysis of the data revealed that decrease in T_3 concentration was more marked in buffaloes suffering from DH (86.6%) as compared to animals affected with TRP (56.7%). No parallel information is available on comparative T_3 concentrations in blood of animals of the subgroups of the disease. Therefore, values observed in the present study can not be compared or contrasted. Significantly lower peripheral concentration of T_3 in DH affected buffaloes observed in the present study could be due to higher degree of stress in these animals.

The peripheral concentrations of thyroxine (T_4) was significantly lower in buffaloes suffering from foreign body syndrome as compared to the control group which is in accordance with the reported observation of lower peripheral concentration of T_4 in buffaloes affected with traumatic pericarditis (Garg *et al.*, 1999).

The decrease in peripheral concentration of thyroxine (T_4) was statistically significant in cases of DH (66.2%) affected buffaloes as compared to animals suffering from TRP

(48.2%) which could be due to the reason that these animals were under greater stress as compared to buffaloes suffering from TRP. These findings may be further substantiated by the fact that the DH affected buffaloes had higher cortisol level in their blood plasma causing more stress as compared to the blood plasma of TRP associated buffaloes (Singh *et al.*, 2005).

The significant decline in thyroid hormones in FBS patients suggest metabolic milieu appreciably lower than basal conditions. The stress and pathological sequence due to presence of foreign body seem to have drastically reduced metabolic rate that needs to be considered during supportive treatment regimen.

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