

## Blood Biochemical Study in Trypanosomiasis Infected Camel (*Camelus dromedarius*)

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### Research Article

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#### ABSTRACT

Blood samples of six healthy and six Trypanosomiasis infected camels (*Camelus dromedarius*) were collected and further analysed for plasma glucose, total protein, albumin, urea and bilirubin. Mean plasma glucose, total protein, and albumin were found to be significantly ( $P < 0.05$ ) check this < or < equal to decreased by 5.87%, 6.66% and 6.80%, in infected animals, respectively. Urea and bilirubin did not reveal any significant variations. Decreased plasma glucose, total protein and albumin levels are suggestive of hypoglycemia, hypoproteinemia and hypoalbuminemia, during the course of parasitemia.

### INTRODUCTION

The camel is the most efficient domesticated animal for converting fodder into work, transport, milk and meat. Camel trypanosomiasis (Surra), caused by *Trypanosoma evansi*, is the most important single cause of morbidity and mortality in camels. Natural and experimental camel trypanosomiasis have been described in different parts of the world [1,2]. Rajasthan (India) is an animal wealth rich state in which animals form the base of rural economy. Trypanosomiasis is widely prevalent in camel, dog, horse, cattle, buffalo, pigs and wild life.

Trypanosomiasis pose a major constraint to camel productivity given their importance as a source of meat, milk production, transportation and draught power as well as by-products (wool, hair, skin and hides).

Haemoprotozoan disease like trypanosomiasis has adverse impact on health, productivity and working capacity of camel. Several blood biochemical variations in haemoparasitised camels may takes place. However, data and literature on this aspect of the diseased camels is scanty. The present study was therefore, planned to study the some important blood biochemical (metabolites) changes in camels, suffering from Trypanosomiasis.

### MATERIALS AND METHODS

A total of twelve (12) adult camels (*Camelus dromedarius*), randomly selected from field, were included in the study. All the camels studied were belonging to the farmer's stock in and around Bikaner zone (Rajasthan). These were divided into two groups:-

- (i) Group-I (n=6):- Consists of six healthy non-infected camels.
- (ii) Group-II (n=6):- Consists of clinically diagnosed trypanosomiasis infected camels.

After blood collection in heparinized sterile tubes plasma was separated. Only non-hemolysed plasma samples were used to further evaluate plasma glucose, total protein, albumin, urea and bilirubin. Samples were analyzed by using standard diagnostic kits.

## RESULTS

Blood biochemical observations measured during the present study in group I (control) and group II (Trypanosomiasis infected) are presented in **Table 1**.

**Table 1.** Mean  $\pm$  SE values of plasma metabolites in healthy and trypanosomiasis infected camels.

Parameter	Healthy camels (group-I) n=6	Diseased camels (group-II) n=6	Percent increase/decrease
Glucose (mmol/L)*	4.992 $\pm$ 0.118	4.699 $\pm$ 0.121	-5.87%
Total protein (gm/L)*	71.121 $\pm$ 0.692	66.386 $\pm$ 1.528	-6.66%
Albumin (gm/L)*	27.339 $\pm$ 0.465	25.479 $\pm$ 0.487	-6.80%
Urea (mmol/L)	5.372 $\pm$ 0.455	5.214 $\pm$ 0.511	-2.93%
Bilirubin (mmol/L)	14.133 $\pm$ 0.221	14.198 $\pm$ 0.214	0.46%

\*- significant at 5% level ( $P \leq 0.05$ )

The hemoprotozoan infection (trypanosomiasis) had a significant ( $P \leq 0.05$ ) effect on glucose (decreased by 5.87%), total protein (decreased by 6.66%) and albumin (decreased by 6.80%), in comparison to control animals (group I). The mean  $\pm$  SE values of urea and bilirubin did not reveal any significant variations between group I and group II animals.

## DISCUSSION

In the present study the blood glucose level decreased significantly in infected animals, is an indicative of the development of hypoglycemia. Observed hypoglycemia in infected animals is well supported by earlier studies [3-5].

Anorexia, decreased intestinal glucose absorption [6] might be considered as attributing factors causing hypoglycemia. It is also likely that the parasites utilize blood glucose of their host for their growth. Possibly; there is also reduction in the rate of glycolysis and gluconeogenesis, due to the disease stress conditions. Endocrine disturbances due to stress conditions may also lead to hypoglycemia [7,8]. Jatkar [9] reported enormous consumption of glucose by the live parasites at room temperature and further stated that, when the parasites are in large number, they consume large quantity of glucose and during their presence the glucose level is reduced.

The mean total proteins in normal healthy camels in the present study were more or less within the range observed by Sabir [10] and Ahmad et al. [11]. In present study a significant effect of trypanosomiasis was observed on the total protein and albumin concentrations. The comparison of the result of increased whether it is increased or decreased plasma protein and albumin levels lead to the conclusion that plasma samples of Trypanosomiasis infected camels have a lower mean total proteins and albumin concentrations than in non-infected camels. Similar findings have also been reported by Safwat and Abadin [12] and Ahmad et al. [11]. Ogunsanmi et al. [13] in West African Dwarf sheep infected with trypanosomiasis reported decreased albumin and albumin: globulin ratio; thus supporting our findings. Mean values of urea and bilirubin did not exhibit any significant variation between infected and non-infected animals. The change in total proteins and albumin values probably corresponds to the degenerative changes in the haemoparasitised check the word organs.

## CONCLUSION

The trypanosomiasis infection had a significant ( $P \leq 0.05$ ) effect on the plasma glucose, total protein and albumin levels, representing hypoglycemia, hypoproteinemia and hypoalbuminemia. The mean values of blood urea and bilirubin revealed non-significant variations.

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