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Extended Abstract
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A Study on the Relationship between Heat Shock Proteins and Serum Biochemical Parameters in Clinically Healthy Bactrian Camels

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Abstract

This study was undertaken to investigate the HSPs levels in serum of different ages and sexes of clinically healthy Bactrian camels and their correlation with some biochemical parameters. Twenty-six two-humped adult camels in two sexes (male=18 and female=8), aged between 2 and 11 years old (2-4 years old=8, 5-8 years old=9, and 9-11 years old=9), were chosen for this study. Serum levels of HSP 30, HSP 40, HSP 70, and HSP 90 were measured by a quantitative sandwich enzyme immunoassay using commercial camel-specific kits. There were no significant differences in the concentration of heat shock proteins (HSP 90, HSP 40, HSP70, and HSP 30) in two sexes and different age groups of clinically healthy Bactrian camels (Camelus bactrianus). However, there was a significant difference in the concentration of creatinine and sodium in two sexes and in the concentration of urea, albumin, and magnesium in different age groups of clinically healthy Bactrian camels (Camelus bactrianus).

Heat shock proteins, (HSPs) or stress proteins, are a large class of proteins which are expressed by prokaryote and eukaryote organisms. These proteins have a significant role in the protection of cellular homeostasis . The HSP species belong to a large protein family consisting of constitutively expressed and inducible members, which are classified according to their molecular weight . Thus, HSPs can be categorized and expressed in kDa: HSP15–30, HSP40, HSP60, HSP70, HSP90, and HSP100. Each HSP family includes several molecules, all sharing a similar primary structure and able to act analogous functions in various subcellular compartments. Based on different studies, the production of HSPs as protective agents against harmful insults enhance transiently due to various stressors. The HSPs are highly conserved proteins and act as molecular chaperons which confer thermotolerance and the protection of the cell to survive injury and oxidative stress. Accordingly, environmental stresses, infection, normal physiological processes, and gene transfer can all promote HSPs level production. Camelus bactrianus, also known as the Bactrian camel, inhabits parts of central Asia and western China. The distinguishing characteristic that sets Bactrian camels apart from dromedary camels is that they have two humps on their backs. There is no information about the HSPs in this species; besides, there has been no previous study about the relationships between these proteins and some biochemical factors (glucose, AST, LDL, cholesterol, phosphorus, iron, calcium, magnesium, total protein, albumin, globulin, urea) in Bactrian camels. Therefore, this study was undertaken to investigate the HSPs levels in the serum of different ages and sexes of clinically healthy Bactrian camels and their correlation with some biochemical parameters.

Keywords: Heat shock proteins; Serum biochemical parameters; Bactrian camels

Conclusion

There were no significant differences in the concentration of heat shock proteins (HSP 90, HSP 40, HSP70, and HSP 30) in two sexes and different age groups of clinically healthy Bactrian camels (Camelus bactrianus). However, there was a significant difference in the concentration of creatinine and sodium in two sexes and in the concentration of urea, albumin, and magnesium in different age groups of clinically healthy Bactrian camels (Camelus bactrianus).

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