

Serum Biochemical Values of *Gazella Subgutturosa* in Ceylanpınar, Şanlıurfa, Turkey

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Abstract

Serum biochemical values were determined in clinically healthy 12 adult (>12 month) female *Gazella subgutturosa* in Ceylanpınar, Şanlıurfa, Turkey. In the present study, we determined the concentrations of glucose (72.4 ± 24.9 mg/dL), total bilirubin (0.31 ± 0.1 mg/dL), blood urea nitrogen (15.6 ± 4.39 mg/dL), creatinine (0.9 ± 0.07 mg/dL), uric acid (0.7 ± 0.33 mg/dL), total protein (7.16 ± 0.33 g/dL), albumin (3.27 ± 0.47 g/dL), cholesterol (52.2 ± 12.72 mg/dL), triglyceride (51.24 ± 17.05 mg/dL) sodium (152.1 ± 4.79 mEq/L), potassium (5.08 ± 0.39 mEq/L), calcium (9.1 ± 0.84 mg/dL), phosphorous (6.6 ± 0.54 mg/dL), chloride (110 ± 3.0 mEq/L), magnesium (1.98 ± 0.08 mg/dL). Furthermore the activity of enzymes AST (189.8 ± 103.7 IU/L), ALT (12.20 ± 9.60 IU/L), ALP (103.8 ± 119.2 IU/L), GGT (50.8 ± 52.5 IU/L), LDH (520.6 ± 179.8 IU/L), CK (194.6 ± 113.8 IU/L), amylase (75.2 ± 32.8 IU/L) were measured. In conclusion we determined reference biochemical values and health status' of *Gazella subgutturosa* in Ceylanpınar, Şanlıurfa, Turkey.

Key words: Ceylanpınar, *Gazella subgutturosa*, Serum biochemical values

INTRODUCTION

Gazelles live in deserts, semi-deserts, hilly plains, and plateaus. Genus gazella belongs to family Bovidae [1]. *Gazella subgutturosa* range in southern and central Asia from eastern Turkey through Iran, Pakistan and Soviet [2]. They are coloured in light brown and the tail is black in colour. Only the male gazella carries horns, which grow 25-43 cm / 10-17.2 inches long [1].

In Turkey, gazelles (*Gazella subgutturosa*) are bred in a desert wildlife reserve for the state production of animals in Ceylanpınar, southeast of Şanlıurfa [3,4]. There are 120 gazelles in Ceylanpınar [5]. *Gazella subgutturosa* is classified as Near Threatened (NT) on the IUCN Red List 2004 [6] and listed under Appendix II of the Convention on Migratory Species (CMS) [7]. Populations throughout the range are subject to illegal hunting and habitat loss. In Turkey hunting is prohibited for the conservation of this species.

It is often difficult to detect when wild animals are ill. Basic haematological and biochemical values are useful in determining health, nutrition and subclinical diseases of the animals [8,9]. Normal values of hematological and biochemical parameters have been reported for domestic and some wild ruminants [8,10,11,12] but normal blood values of genus *Gazella* (*Artiodactyla*, Bovidae) is scarce. Therefore there is not enough report on the biochemical values for Turkey's gazelles. The aim of this study is to investigate some serum biochemical values of *Gazella subgutturosa* in Ceylanpınar, Şanlıurfa, Turkey to report their health status.

MATERIALS AND METHODS

This study was performed in 12 adult (>12 month) female gazelles born in a large enclosed area in which they roam freely in Ceylanpınar. All animals were clinically healthy. The animals were manually restrained and no sedatives were used. The gazelles were fasted overnight in pens and then examined. Blood was taken from the jugular vein into the serum tubes. For biochemical analyses blood samples centrifugated at 3.000 rpm for 10 minute to obtain serum. All samples were analyzed in a week.

Serum samples were analyzed for aspartate transaminase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), gamma-glutamyltransferase (GGT), laktatdehidrogenase (LDH), creatinine kinase (CK), amylase, glucose, uric acid, cholesterol, tryglyceride, blood urea nitrogen (BUN), creatinin, total bilirubin, total protein, albumin concentration by using commercial kits (Teco Diagnostics, California, U.S.A.). And duplicate analysis were performed for the samples.

Serum sodium (Na), potassium (K), calcium (Ca), phosphore (P), chloride (Cl) and magnesium (Mg) levels were studied using an autoanalyzer (XL-600, Erba, India).

Descriptive Statistics were determined according to the measured parameters in gazelles.

RESULTS

In the present study we investigate some serum biochemical values of *Gazella subgutturosa* in Ceylanpınar, Şanlıurfa, Turkey to report their health status. Table 1 shows the mean,

standart deviation and range of serum biochemical values in 12 of healthy female gazelle.

Table 1. Mean, standart deviation and range of serum biochemical values in 12 of healthy female gazelle (*Gazella subgutturosa*)

Parameters	Mean \pm SD	Range
Glucose (mg/dL)	72.4 \pm 24.9	40.0- 108.0
Total Bilirubin (mg/dL)	0.31 \pm 0.1	0.22- 0.46
Direct Bilirubin (mg/dL)	0.04 \pm 0.04	0.0- 0.09
Blood Urea Nitrogen (mg/dL)	15.6 \pm 4.39	10.0- 20.0
Creatinine (mg/dL)	0.9 \pm 0.07	0.81- 1.0
Uric Acid (mg/dL)	0.7 \pm 0.33	0.3- 1.1
Total protein (g/dL)	7.16 \pm 0.33	6.7-7.6
Albumin (g/dL)	3.27 \pm 0.47	2.7-3.8
Cholesterol (mg/dL)	52.2 \pm 12.72	39.0- 69.0
HDL-Cholesterol (mg/dL)	21.0 \pm 3.87	17.0-26.0
Tryglyceride (mg/dL)	51.24 \pm 17.05	23.50 - 78.98

Also we determined the serum enzyme activities of AST, ALT, ALP, GGT, LDH, CK and amylase. And table 2 shows the mean, standart deviation and range of enzyme activities of healthy gazelles. In the glucose concentration and AST, GGT, LDH, ALP, CK enzyme activities, wide variations were determined.

Table 2. Mean, standart deviation and range of enzyme activities in 12 of healthy female gazelle (*Gazella subgutturosa*)

Parameters	Mean \pm SD	Range
AST (IU/L)	189.8 \pm 103.7	43.0- 273.0
ALT (IU/L)	12.20 \pm 9.60	2.0- 28.0
GGT (IU/L)	50.8 \pm 52.5	0.0-138.0
LDH (IU/L)	520.6 \pm 179.8	306.0- 796.0
ALP (IU/L)	103.8 \pm 119.2	33.0- 315.0
CK (IU/L)	194.6 \pm 113.8	93.0- 383.0
CK-MB (IU/L)	343.6 \pm 149.2	173.0- 505.0
Amylase (IU/L)	75.2 \pm 32.8	50.0- 132.0

In the present study we measured the levels of Na, K, Ca, P, Cl and Mg to determine health status of *Gazella subgutturosa*'s in Ceylanpınar, Şanlıurfa, Turkey. Table 3 shows the mean, standart deviation and range of serum electrolyte levels of gazelles.

Table 3. Mean, standart deviation and range of serum electrolyte levels in 12 of healthy female gazelle (*Gazella subgutturosa*)

Parameters	Mean \pm SD	Range
Na (mEq/L)	152.1 \pm 4.79	147.9-160.0
K (meq/L)	5.08 \pm 0.39	3.7- 6.5
Ca (mg/dL)	9.1 \pm 0.84	6.5- 11.7
P (mg/dL)	6.6 \pm 0.54	5.4- 7.8
Cl (mEq/L)	110 \pm 3.0	107.0-115.0
Mg (mg/dL)	1.98 \pm 0.08	1.9-2.1

DISCUSSION

Gazelles and other wild animals can be reservoir of the important diseases of farm animals. Therefore blood reference values are important for determination of the health status and disease of these animals. But there is limited information about their blood chemistry.

In this study, we investigate some serum biochemical values of *Gazella subgutturosa* in Ceylanpınar, Şanlıurfa, Turkey. Serum albumin, uric acid and magnesium levels were similar with *G. dama* [13]. However the tryglyceride levels were similar to *G.cuvieri* and *Antilope cervicapra* [8,13]. As determined previously direct bilirubine and total bilirubine levels were very lower than the levels of *G. dama* [13]. Total bilirubine levels was similar to *G. granti* [14] and white-tailed deer [15].

Gazella subgutturosa had a lower creatinin, ALT, chloride, cholesterol, total bilirubine, blood urea nitrogen, uric acid and glucose levels with higher AST, potassium, phosphore and total protein levels compared with *Gazella dama* [13].

We also obtained similar results with Yaraloğlu et al [3] concerning the levels of in glucose, sodium, potassium, calcium, phosphore and chloride in the *Gazella subgutturosa*, but obtained higher levels of AST and ALT.

GGT levels of the gazelles were found similar with white-tailed deers (*Odocoileus virginianus*) [15]. Although CK levels were higher than Arabian Sand Gazelles [16] in the study, it was similar to adult white-tailed deer values [15]. But there was no data about the value of CK-MB fraction in gazelles and no reference have been found in the literature about amylase levels of gazelles. This findings has not been described in domestic livestock nor in other gazella species.

Also the sodium, potassium, calcium, phosphore, chloride and magnesium levels were found similar with the other reported values for different Gazelle species [10,13,14,15].

Peinado et al [8] performed a detailed study in the *Gazella dorcas* and *Antilope cervicapra*, showing that ALP, AST, ALT, creatinin, sodium, potassium, calcium, chloride and magnesium values were higher than the results of present study. In addition to the higher ALT and AST levels, total protein, blood urea nitrogen, cholesterol, calcium, phosphorous, sodium, potassium and LDH levels were much similar to *Dorcas gazella*.

In this study the serum biochemical values of *Gazella subgutturosa* were found similar with the other *Gazella* species. However, some variations may be associated with species, nutritional status, climate, season, stress of capturing [3,12].

CONCLUSIONS

It is often difficult to detect subclinic diseases of wild ruminants. And they may be reservoirs of some livestock diseases such as leptospirosis, anaplasmosis and rinderpest [3]. Biochemical parameters have been using in diagnosis and prognosis of the animals' diseases. So it is important to determine blood biochemical values for the determining the health status and diseases of gazelles. In the present study, the reference biochemical values of *Gazella subgutturosa* in Ceylanpınar, Şanlıurfa, Turkey were determined. Therefore,

health status and diseases of gazelles will be monitored quickly and easily. Additionally, it will be helpful for the future research studies on *Gazella subgutturosa* and the other wild ruminant species (e.g. other *Gazella* species, deers, etc.).

REFERENCES

- [1]. Huffman B. 2004. *Gazella subgutturosa*. Address: <http://www.ultimateungulate.com> Date: 22.03.04
- [2]. Benirschke K. 2004. Persian Goitered Gazelle *Gazella subgutturosa subgutturosa*. Address: <http://medicine.ucsd.edu/cpa/persiangaz.html>. Date: 20.04.2004
- [3]. Yaralıoğlu S, Şahin T, Şındak N, Yürekli UF. 2004. Investigation of some hematologic and biochemical parameters in the serum of gazelles (*Gazella subgutturosa*) in Ceylanpınar. *Turkish Journal of Veterinary Animal Sciences*. 28: 369-372.
- [4]. Anonym 2005. *Gazella (Trachelocele) subgutturosa*. Address: <http://www.geocities.com/mammalia2000/Gasub.htm>. Date: 05.08.2005
- [5]. Anonym 2006. Ceylanlar. Address: <http://www.sanliurfacevreorman.gov.tr/ceylan.htm> Date: 05.03.2007.
- [6]. IUCN 2004. Red list of Threatened species. Address: www.redlist.org Date:05.03.2006
- [7]. CMS 2005. Convention on Migratory Species. Address: <http://www.cms.int> Date: 30.12.2005
- [8]. Peinado V, Viskor G, Palomeque J. 1990. Hematology and Blood Chemistry in Captive Dorcas Gazelles And Blackbucks. *Comparative Biochemistry and Physiology*. 4: 595-599.
- [9]. Sleeman JM, Widdowson MA. 1993. Haematological reference values for East African Wild Ungulates. *Research in Veterinary Science*. 54: 261-263.
- [10]. Bush M, Smith EE, Custer RS. 1981. Hematology and serum chemistry values for captive dorcas gazelles: variations with sex, age and health status. *Journal of Wildlife Disease*. 17: 135-143.
- [11]. Walther FR. 1990. Gazelles and related species. In: Grzimek's Encyclopedia of Mammals. (ed. Parker SP), pp. 462-484, McGraw-Hill, New York
- [12]. Rietkerk EF, Delima EC, Mubarak MS. 1994. The hematological profile of the Mountain Gazella (*Gazella Gazella*): Variations with sex, age, capture method, season and anesthesia. *Journal of Wildlife Disease*. 30(1): 69-76.
- [13]. Abaigar T. 1993. Hematology and plasma chemistry values for captive dama gazelles (*Gazella Dama Mhorr*) and Cuvier's Gazelles (*Gazella Cuvieri*): Age, Gender and Reproductive Status Differences. *Journal of Zoo and Wildlife Medicine*. 24(2): 177-184.
- [14]. Seal US & Schobert EE. 1976. Baseline laboratory data for the Grant's gazelle (*Gazella granti*). *Journal of Zoo Animal Medicine*. 7(1): 7-10.
- [15]. Seal US, Verme LJ, Ozoga JJ. 1981. Physiologic Values In: Diseases and Parasites of White-tailed Deer. (ed. William Davidson) Misc. Publication No.7, pp. 19-34. Tall Timbers Research Station, Tallahassee, Fla.
- [16]. Vassart M, Greth A, de la Farge F, Braun JP. 1994. Serum chemistry values for Arabian Sand Gazelles (*Gazella subgutturosa marica*). *Journal of Wildlife Diseases*. 30(3): 426-428.