

Clinical Hypothyroid goiter in *Camelus dromedarius* (Case Report)

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Summary:

A young camel case (less than 2 years old) suffered from hypothyroidism was recorded in Al-ain area , United Arab Emirates. Goiter was not observed in this region previously . The signs , blood picture, clinical biochemical changes as well as the levels of circulating thyroid hormones (T₃ & T₄) were recorded and discussed . The post-mortum findings and histopathological changes of the affected glands were described .

Introduction

Goiter is recorded in different animal species including camels (Abu-Damir et al.,1990) . Hypothyroidism in animals could be attributed mainly to raising the animals in geographic area suffered from iodine deficiency (????) However some cases could be related to presence of goiterogenic substances, pituitary insufficiency , thyroiditis as well as inborn defects of thyroid hormone synthesis (Underwood, 1977 and Ricketts et al, 1985)

The published reports about goiter in camels are very meager. Decker *et al* (1979), Abu Damir *et al* (1990) have described histopathological changes in Camel goiter.

Goiter was not previously described in Al Ain area despite some unpublished information regarding presence of some goiter cases were seen in the western region of Abu Dhabi (Personal comments). Goiter in Camels is not

documented before in of the United Arab Emirates and this is the first clinical case to be reported.

Materials and Methods:

The calf-camel under 2 years old was submitted to the Veterinary Hospital of Al-Ain, United Arab Emirates in march 2005 with a complaine of long history of presence of enlarged oedematous hard granulomatous lesions close to the base of animal's head.. Presence of this lesion at the time of birth or developed after birth was uncertain by the owner .

The case was blood sampled from the juglar vein for routine hemogram analysis using T830 haematology analyzer (Beckman / Coulter) and general serum clinical chemistry. Using Beckman LX 20 (Bekcman / Coulter) . The level of Copper (Cu) was determined using Atomic Absorption (Shimadzu).

The whole blood samples were assayed for thyroid hormone levels (fT3, fT4, TSH) using Architect (Abbott).as well as the levels of Thiamin (Vitamin B1) using HPLC (Waters) .

A data of 40 apperently healthy calf-camels of the same age and sex were run parallel and handled as treated as control .

The affected case was sacrificed shortly after sampling and the necropsy findings were described and parts of the thyroid tissues were fixed in formol saline , processed , sectioned and stained with haemotoxylin and eosin.

1. ICP MPX-Pro (manufacturer Varian, Ustralia) for Trace elements.
2. Microwave Oven (Millestone – UK)

RESULTS

Table 1: *Effect of Goiter on some haematological parameter*

Parameter	Healthy camel (n = 40)	Afflicted camel	P
PCV (%)	30.50 ± 2.91	18.0	< 0.01
Hb (g/dL)	14.10 ± 1.71	7.5	
RBCs (10¹² / L)	8.71 ± 1.49	4.4	
WBCs (10⁹ /L)	13.83 ± 1.65	11.6	
Neutrophils (%)	55.20 ± 3.73	84	
Lymphocytes (%)	37.70 ± 2.76	12	
Esinophils (%)	4.59 ± 0.41	2	
Monocytes (%)	2.51 ± 0.38	2	

- *Values in the table are means ± SEM .*
- *Comparison between each two set of values has been made by the t-test*
- *P less than 0.05 is considered statistically significant.*

Table 2: Levels of some serum constituents in the affected case.

Parameter	Healthy camel (n = 40)	Afflicted camel	P
Glucose (mg /dL)	112.19 ± 4.27	154	
BUN (mg / dl)	19.60 ± 0.71	46	
Creatinine (mg / dl)	1.82 ± 0.06	2.8	
Total protein (g/dL)	6.45 ± 0.07	5.4	
Albumin (g/dL)	3.60 ± 0.03	1.5	
Globulin (g/dL)	3.41 ± 0.10	3.9	
Calcium (mg /dL)	10.35 ± 0.06	8.7	
Phosphorus (mg /dL)	6.12 ± 0.04	3.4	
Iron (µg/dL)	109.70 ± 7.32	42	
IBCT (µg/dL)	223.94 ± 3.93	163	
Sodium (mmol/L)	152.00 ± 1.50	147	
Potassium (mmol/L)	4.30 ± 0.43	4.2	
Chloride (mmol/L)	104.00 ± 5.40	116	
Magnesium (mg /dL)	2.60 ± 0.15	2.4	
Copper (µg /dL)	73.00 ± 3.40	58	
Carbon dioxide mmol/L)	21.50 ± 2.50	21	
Cholesterol (mg /dL)	38.32 ± 0.75	102	
Triglyceride (mg /dL)	42.06 ± 0.98	4.5	

Values in the table are means ± SEM.

Comparison between each two set of values has been made by the t-test .P less than 0.05 is considered statistically significant.

Table 3: The effect of Goiter on the activities some serum enzymes.

Variable	Healthy camel (n = 40)	Sick case	P
ALP (U/L)	69.40 ± 4.30	53	
CK (U/L)	87.92 ± 3.80	395	
ALT (U/L)	17.19 ± 0.36	19	
AST (U/L)	74.60 ± 2.11	141	
LDH (U/L)	439.60 ± 8.01	487	>0.1
GGT (U/L)	20.13 ± 0.67	94	

- *Values in the table are means ±SEM.*
- *Comparison between each two set of values has been made by the t-test.*
- *P less than 0.05 is considered statistically significant.*

Table 5: Levels of thyroid hormone in the affected case

Hormone	Healthy camel (n = 18)	Sick case	P
TSH (mIU/L)	0.003 ± 0.001	0.01	
Free T 4 (pmol/L)	16.5 ± 0.33	5.2	< 0.01
Free T 3 (pmol/L)	5.3 ± 0.41	1.5	< 0.01

- Values in the table are means ± SEM.
- Comparison between each two set of values has been made by the t-test.
- P less than 0.05 is considered statistically significant.

Discussion

To our knowledge, this is the first report that has recorded the incidence of clinical goiter in camels at Al-Ain area (UAE) .

Combination of low iodine intake and high intake of goitrogenic substances can induce goiter, (Gaitan,1990).The cause of goiter in the recorded case is unknown. . The literatures listed a number of factores coincided with development of goiter in animals . This includes low iodine intake , ingestion of animal feeds contained some goitrogenic materials such as millet (Sartelet et al .,1996) ; soybeans (Divi et al. ,1997); pine nuts (Gaitan ,1990); and some seed meals (Mawson ,1994) . Environmental pollutants like heavy metal poisonings, and certain drugs might be accused in that respect too (Prescott ,1992), and (Gaitan ,1990).

Some authores mentioned that deficiencies of Zinc, Manganese and Retinol might be contributed to the inability to use the iodine intake and to the development of goiter (Ozata et al, 1999 , Kawada, 1985, Osman et al, 1981).Selenium deficiency may also contribute to goiter (Untoro et al, 1999). High levels of Calcium and Magnesium and certain types of Bacterai in drinking water have also been shown to be goiterogenic (Gour et al, 1989).

Therefore , proper nutrition and healthy water supply are crucial in the prevention of goiter.

The mean values of fT3 and fT4 we in this study are in agreement with that reported by Wasfi *et al* in Camels of UAE (1987). The average serum concentration of T3 and T4 in adult llamas ranged from 1.29 ng/ml to 1.55 ng/ml and from 61.73 to 76.04 ng/ml. The mean relation of T4/T3 was 50.6% (matthias et al .1997)

The level of cholesterol in the sick case is high which could be understandable on the light of fact T4 stimulate cholesterol metabolism and its removal from circulation by the liver. Larsson (1988) found that the fT4 and serum cholesterol were the best combination of initial screening tests to detect hypothyroid dogs. More work is needed to evaluate the prevalence of subclinical and clinical goiter in camel farms in the United Arab Emirates.

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