

Rickets in a Gazelle: a Case Report

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Abstract: The purpose of this study was to determine some clinical, radiological, haematological and biochemical findings in a female gazelle, 9 months old, with rickets.

In clinical examination, the animal was unable to stand up easily, its legs were bent and walking was difficult. The medullar canals were wide and the cortex was thin in the long bones on the radiogram. The Ca level (6.8 mg/dl) was found to be within the minimum normal limits in the biochemical examinations of blood serum. Also, serum P level (1.6 mg/dl) was ascertained to be markedly lower than normal levels. In addition, serum ALP activity (3609 IU/L) was clearly higher than normal values. The range of Ca/P was calculated as 4.25/1. But other haematological and biochemical parameters were found to be within normal values reported in gazelles.

Key Words: Rickets, gazelle, Ca, P, ALP

Bir Ceylanda Raşitizm Olgusu

Özet: Bu çalışma, 9 aylık raşitizimli dişi bir ceylanda klinik ve radyolojik muayeneler ile bazı hematolojik ve biyokimyasal parametrelerin saptanması amacıyla yapıldı.

Klinik muayenede bacaklardaki deformasyon nedeniyle hayvanın ayakta durmada ve yürümede zorluk çektiği görüldü. Radyografide uzun kemiklerde medullar kanalın geniş ve korteksin ince olduğu belirlendi. Biyokimyasal muayenelerde ise serum Ca düzeyi (6,8 mg/dl) normalin minimum sınırlarında, P düzeyi (1,6 mg/dl) normalden çok düşük ve ALP aktivitesi ise normal değerlerin çok üzerinde bulundu. Ayrıca Ca/P oranı 4,25/1 olarak saptandı. Ancak diğer hematolojik ve biyokimyasal parametreler ceylanlarda bildirilen normal değerler arasında bulundu.

Anahtar Sözcükler: Raşitizm, Ceylan, Ca, P, ALP

Introduction

Gazelles live in Mongolia, Syria, Iran, Saudi Arabia and Turkmenistan, as well as in the region of Ceylanpınar, Şanlıurfa. These beautiful fine boned animals live in the wild.

When these animals are placed in captivity in stables away from ultraviolet light, rickets may occur (1-4). Rickets, characterised by hyperplastic osteodystrophy in the skeletal system, is found in growing animals (3,5,6). In healthy gazelles, normal Ca and P values have been reported as 6.1-15.2 and 2.7-8.35 mg/dl, respectively (7,8). It occurs because of Ca and P metabolic dysfunction and a lack of sunlight. Ca and P levels in blood serum decreases and they are easily excreted without being

metabolised due to vitamin D deficiency. Thus, the Ca/P balance is impaired (1,4,6,9).

The aim of this study was to determine some clinical, radiological, haematological and biochemical values in a gazelle with rickets. No other study about rickets in gazelles was found in the literature. For that reason, publishing of this case may contribute to veterinary practice.

Case

A female gazelle, 9 months old, was brought to the teaching hospital of the Veterinary Faculty, Harran University. The owner reported that the animal was

raised in a closed stable, without direct sunlight from 1 month to 9 months old. The animal was fed on straw and concentrated feed. It was unable to stand up easily, its legs were bent and walking was difficult. In this study, some clinical, radiological, haematological and biochemical findings were presented.

Findings

In clinical examination, the temperature of the gazelle was 39.2°C and the pulse rate was 93/min and the respiratory rate was 14/min and the lymph nodes and conjunctivae were normal. In the inspection, the

extremities were flexed because of the relaxation of the joint ligaments. The animal had an abnormal posture. In addition, the hooves appeared dry and turned back. It had difficulty walking and standing. It was very noticeable that the gazelle's weight was on the heels (Figures 1 and 2).

In the A/P radiogram, the medullary canals were wide and the cortex was thin in the long bones (Figure 3).

Blood samples were taken and placed in a test tube with EDTA for haematological parameters and a vacutainer tube for biochemical parameters. Normal values in healthy gazelles were compared with levels obtained in this case (Table).



Figure 1. Lateral view of the gazelle.



Figure 2. Front view of the gazelle.



Figure 3. Radiographic view of the forelegs, A/P position.

Table. Values of haematological and biochemical parameters in this case and in healthy gazelles.

Parameters	Case values	Normal values	Literature
WBC ($10^3/\text{mm}^3$)	10.3	5.52-11.0	7,8,10,11
RBC ($10^6/\text{mm}^3$)	10.62	4.1-12.4	7,8,10-12
Hb (g/dl)	16.6	11.1-22.0	7,8,10-12
PCV (%)	47.1	31-63	7,8,10-12
MCV (fl)	44.4	36.74-62.9	11,12
MCH (pg)	15.7	12.2-30.38	7,8,10-12
MCHC (g/dl)	35.3	23.92-44.5	7,12
Glucose (mg/dl)	123	68-179	7,8
AST (IU/L)	102	10-104	7,8
ALT (IU/L)	25	14-61	7,8
LDH (IU/L)	857	380-890	8
CK (IU/L)	136	132 ± 116.7	8
ALP (IU/L)	3609	814 ± 342.9	8
Ca (mg/dl)	6.8	6.1-15.2	7,8
P (mg/dl)	1.6	2.7-8.35	7,8
Mg (mg/dl)	2.84	0.97-4.8	7,8

Discussion

In clinical examination, vital functions such as temperature, pulse and respiratory rate were within normal ranges but the animal had an abnormal posture. It had difficulty walking and standing. The animal's extremities were flexed in the inspection. These clinical findings discovered in the case seem to be similar to the clinical findings related to rickets in domestic animals (1-4,6,9,13-15).

In addition, radiogram findings are compatible with the literature (3,16,17). Furthermore, researchers (3,16) report that animals with rickets have costa-capital deformation and fissures or callus formation on the extremities. But these were not observed in this case.

As shown in the Table, WBC, RBC, Hb, PCV, MCV, MCH, MCHC, Glucose, AST, ALT, LDH, CK and Mg levels were found to be within normal ranges as reported in the literature (7,8,10-12).

Some researchers (1,3-6,9,13,15,18) reported that rickets caused a slight decrease in Ca, marked decrease in P and a clear increase in ALP levels. Furthermore, they reported that Ca and P were excreted easily without being metabolised because of Vitamin D deficiency. Thus, the Ca/P ratio (2/1) is impaired. In this case, the serum Ca level was found to be within the minimum normal limits and also the P level was markedly lower than normal. In addition, serum ALP activity was clearly higher than normal levels. On the other hand, the Ca/P ratio was calculated as 4.25/1. These results resemble those of other studies (1,3-6,9,13,15,18) on rickets.

In conclusion, serum ALP activity was found to be much higher than normal, otherwise the P level was markedly low. Furthermore, gazelles having a slender and delicate bone structure and living in natural conditions may tend to suffer from rickets if they are kept in a closed stable at an early age. For that reason, we are of the opinion that living conditions of gazelles should not be changed.

References

1. Blood, D.C. and Radostits, O.M.: Veterinary Medicine. A Textbook of the Diseases of Cattle, Sheep, Pigs, Goats and Horses. Seventh Edition, Bailliere Tindal, London, 1989.
2. Aytuğ, C.N., Alaçam, E., Görgül, S., Gökçen, H., Tuncer, Ş.D. ve Yılmaz, K. : Sığır Hastalıkları. 2. Baskı, Tümvet Hay. ve Vet. Hiz. Tic. Ltd. Şti., Yayın No: 3, Teknografik Matbacılık ve Ambalaj Sanayi, İstanbul, 1991.
3. Samsar, E., Akın, F. ve Anteplioğlu, H. : Klinik Tanı Yöntemleri ve Genel Cerrahi. 6. Baskı, Tamer Yayıncılık Tanıtım Hizmetleri, Ankara, 1996.
4. İmren, H.Y. ve Şahal, M. : Veteriner İç Hastalıkları. 2. Baskı, Feryal Matbaacılık San. ve Tic. Ltd. Şti., Ankara, 1991.
5. Dercksen, D.P. and Berger, J.M.: Rickets-Like Bone Changes in Goat Kids Fed with Artificial Milk Intended for Calves. Tijdschr. Diergeneeskde, 1992; 117, (21): 629-631.
6. Rosenberger, G., Dirksen, G., Grunder, H.D. und Stöber, M. : Krankheiten des Rindes. Blackwell Wissenschafts-Verlag, Berlin, 1994.
7. Abaigar, T.: Hematology and Plasma Chemistry Values for Captive Dama Gazelles (*Gazella dama mhorr*) and Cuier's Gazelles (*Gazella cuieri*): Age, Gender and Productive Status Differences. J. Zoo and Wildlife Medicine, 1993; 24, (2): 177-184.
8. Peinado, V., Viscor, G. and Palomeque, J.: Haematology and Blood Chemistry in Captive Dorcas Gazelles and Blackbuns. Comp. Biochem. Physiol., 1990; 97A, (4): 595-599.
9. Lalov, K.H., Tsvetkov, A., Antonov, S., Dimitrov, A. and Goranov, K.H.: Study of Disorders in Calcium and Phosphorus Metabolism in the Intensive Fattening of Young Cattle. Vet. Med. Nauki, 1976; 13, (1): 8-22.
10. Bush, M., Simith, E.E. and Custer, R.S.: Haematology and Serum Chemistry Values for Captive Dorcas Gazelles: Variations with Sex, Age and Health Status. J. Wildlife Diseases, 1981; 17, 135-143.
11. Rietkerk F.E., Delima, E.C. and Mubarek, S.M.: The Haematological Profile of the Mountain Gazelle (*Gazella gazella*): Variations with Sex, Age, Captive Method, Season and Anesthesia. J. Wildlife Diseases, 1994; 30, (1): 69-76.
12. Sleeman, M.: Haematological Reference Values for East African Wild Ungulates. Res. Vet. Sci., 1993; 54, 261-263.
13. Behrens, H.: Lehrbuch der Schafkrankheiten. Verlag Paul Parey, Berlin und Hamburg, 1979.
14. Bonniwell, M.A., Smith, B.S., Spence, J.A., Wright, H. and Ferguson, D.A.: Rickets Associated with Vitamin D Deficiency in Young Sheep. Vet. Rec., 1988; 122, (16): 386-388.
15. Rogowska, W. and Kozłowska, K.: Serum Calcium, Inorganic Phosphorus and Alkaline Phosphatase Levels in Sheep with Deformities of the Extremities. Pol. Arch. Weter., 1986; 25, (4): 121-130.
16. Alkan, Z. : Veteriner Radyoloji, Mina Ajans, Ankara, 1999.
17. Pond, W.G., Yen, J.T., Hill, D.A., Ferrell, C.L. and Krook, L.: Bone Lesions in Growing Swine Fed 3% Cement Kiln Dust as a Source of Calcium. J. Anim. Sci., 1982; 54, (1): 82-88.
18. Richter, G.H., Flachowsky, G., Ochrimenko, W.I. and Geinitz, D.: The Effect of Various Ca and P Supplies on the Metabolic Parameters of Wethers and Bulls and on the Fattening Performance of Bulls with Vitamin D Deficiency. Arch. Tierernähr, 1989; 39, (3): 345-359.