

INVESTIGATIONS OF WRY-NECK SYNDROME IN CAMELS (*Camelus dromedarius*)

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ABSTRACT

Haematological, parasitological and serological investigations of 6 affected and 5 non-affected control dromedary camels were done to study the pathological changes and to identify the possible aetiology of the wry-neck syndrome in camels (*Camelus dromedarius*). Affected camels showed loss of appetite, loss of condition, weakness, paleness of the mucous membranes and S-shaped bending in the neck region. Affected camels also had some degree of leukocytosis and moderate anaemia. Five out of the 6 affected camels (83%) were brucellosis seropositive unlike the control camels where 1 out of the 5 involved camels (20%) was brucellosis seropositive. Both the traditional and modern methods of treatment of wry-neck syndrome were described.

Key words: Camel, investigations, wry-neck syndrome

Wry-neck syndrome is a fairly frequent, poorly understood disease condition affecting camels resulting into irreversible S-shaped bending of the neck. It is a slowly developing syndrome, which either terminates fatally due to the inability of the affected animal to extend its neck for feeding, or the animal recovers slowly but with irreversible bending of the neck. In this communication the results of clinical and laboratory investigations of this syndrome in camels are presented and discussed.

Materials and Methods

Animals

Eleven dromedary camels of both sexes aged 4-10 years were used in this investigation. The camels were assigned to two groups. Camels numbered 1, 2, 3, 4, 5, and 6 (Group 1) were affected with the wry-neck syndrome while camels numbered 7, 8, 9, 10 and 11 (Group2) were unaffected control. The camels were either presented to the Gedaref Veterinary Clinic, Eastern Sudan, for treatment or sent to the district abattoir for slaughter. Upon arrival to the clinic or to the abattoir, the affected camels were subjected to thorough clinical investigation and the necessary clinical data including disease history, general health condition, body temperature, pulse and respiratory rate were recorded.

Haematological investigations

Blood samples were collected from the affected camels and healthy ones. Blood samples were tested for total erythrocytes counts (TEC), haemoglobin (Hb), packed cell volume (PCV), total leucocyte count (TLC) and differential leucocyte count (DLC) according to the methods described by Pratt (1992). The mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH) and mean corpuscular haemoglobin concentration (MCHC) were calculated according to Mills and Valli (1988).

Faecal samples

Faecal samples were collected from affected and unaffected camels and were investigated for helminth parasites (Anon, 1977).

Serum samples

Serum was separated from the blood samples of affected and unaffected camels and tested for brucellosis using Rose Bengal Plate Test (RBPT) as described by Alton *et al* (1988).

Results

Camels numbered 1, 2, 3, 4, 5 and 6 (Group 1) showed loss of appetite, loss of condition, weakness, and pale mucous membrane. They had relatively high body temperature and the neck was showing the characteristic S-shaped bending

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of the wry-neck syndrome. Table 1 shows the haematological values for affected and unaffected camels. The differential leucocyte count (DLC) of affected and unaffected camels are shown in Table 2. The haematological picture of the affected camels showed some degree of leukocytosis (Animal No. 4, 5 and 6) with particular increase in the number of lymphocytes and basophils. Two of the affected camels (Number 4 and 6) had moderate anaemia. The results of faecal egg count, blood parasites examination, brucellosis testing are summarised in table 3. Most of the affected camels (5 out of 6) (83%) had helminths infection and the same number and percentage of camels were brucellosis seropositive.

(Table 3) (83%) compared to unaffected control camels in the same table (20%) draws some attention regarding the possible involvement of brucellosis as an aetiology of this syndrome. The clinical manifestations of brucellosis in other livestock species that might be clinically related to the wry-neck syndrome include osteoarthritis and synovitis in sheep and goats and the development of fistulous withers and poll evil in the neck region in equines (Chakarabarti, 1993). The remarkable load of helminth infection in most of the camels involved in this investigation is a common finding among the dromedary camels in the geographical area of this investigation (Fadl *et al*, 1989; Agab, 1993).

Table 1. Haematological values (SI units) of affected and unaffected dromedary camels.

Parameter	Groups			
	Group 1		Group 2	
	Mean ± SD	Range	Mean ± SD	Range
Total erythrocyte count (TEC) (10 ¹² /L)	8.46 ± 2.33	(6.1 - 10.8)	5.8 ± 0.73	(5 - 6.4)
Packed cell volume (PCV) (%)	0.26 ± 0.064	(0.17 - 0.36)	0.23 ± 0.089	(0.23 - 0.25)
Haemoglobin (Hb) (g/dl)	8.55 ± 2.12	(5.7 - 9.3)	7.28 ± 0.31	(7.6 - 8)
Mean corpuscular volume (MCV) (fl)	34.53 ± 4.40	(20 - 58)	41.39 ± 7	(35.96 - 50)
Mean corpuscular haemoglobin (MCH) (pg)	11.34 ± 4.40	(6.86 - 19.56)	13.7 ± 2.37	(11.87 - 16.6)
Mean corpuscular haemoglobin concentration (MCHC) (g/dl)	35.07 ± 3.13	(33.3 - 41)	33.13 ± 0.13	(33.04 - 33.33)
Total leucocyte count (TLC) (10 ³ /L)	20.53 ± 3.13	(11.85 - 39)	13.17 ± 1.87	(10.7 - 15.3)

Discussion

Wry-neck is poorly understood, relatively significant disease of camels (Fig 1). In a disease surveillance among camels in the Butana region of eastern Sudan, Agab (1993) recorded 23 camels affected with wry-neck disease out of 10518 (0.22%) animals investigated during one year with increased incidence occurring in the summer season. The disease was reported by the same author to cause mortality of 12 (2.9%) out of 421 camels died during the same study period.

In the haematological investigation of affected camels, the increased number of leukocytes particularly the relatively high percentages of lymphocytes and basophils and low percentages of the neutrophils might strongly denotes the presence of an overwhelming microbial infection and/or an initiation by antigenic stimulation due to an infectious agent (Benjamin, 1998). However, the generally higher percentage of brucellosis seropositive reactors

Table 2. Differential leucocyte count (DLC).

Type of white blood cells	Camel group			
	Group 1		Group 2	
	Mean ± SD	Range	Mean ± SD	Range
Lymphocytes (L)	58.66 ± 2.87	(55-63)	25.8 ± 7.22	(16-36)
Basophiles (B)	2.0 ± 1.7	(0-5)	0.4 ± 0.5	(0 - 1)
Neutrophils (N)	32.16 ± 2.22	(29 - 35)	68.0 ± 6.63	(59 - 77)
Monocytes (M)	1.5 ± 1.4	(20 -58)	1.4 ± 0.89	(0 - 2)
Esoinophils (E)	5.66 ± 2.58	(2- 9)	4.4 ± 1.4	(2 - 5)

The possible documented causes of this syndrome include injury of the animal which may result into falling down of parts of the neck bones leading to this syndrome or due to shortage and deficiency of vitamin B in the feed or it occurs as a results of plant poisoning particularly in the

Table 3. Results of faecal egg count, blood parasite and Rose Bengal Plate Test.

Group No.	Camel No.	Age (years)	Sex	Faecal (Egg/gm of faeces)	Blood parasites	RBPT
1	1	8	F	60000	+ve for microfilaria	-ve
	2	9	M	2500	-ve	+ve
	3	4	F	200	-ve	+ve
	4	4	M	-ve	-ve	+ve
	5	4	F	1400	-ve	+ve
	6	6	F	10000	-ve	+ve
2	7	8	F	1300	-ve	-ve
	8	9	M	500	-ve	+ve
	9	8	M	200	-ve	-ve
	10	10	M	400	-ve	-ve
	11	8	F	1000	-ve	-ve

beginning of the rainy season when there is a lot of lush forages (Kohler-Rollefson *et al*, 2001). The same authors also reported that this condition may also occur following surgical operations when the animal recovers from sedation and anesthesia.

The characteristic anatomical features of camels manifested in their long neck might predispose to the high susceptibility of the dromedary species to this syndrome. This assumption might be supported by the fact that some other long-necked species are affected with this syndromes since a very similar condition has been noticed in ostriches (*Struthio camelus*), both juvenile and adults in Saudi Arabia (Agab, unpublished data). However, a single case of wry-neck disease in juvenile camels was not recorded during an extensive field survey of camel diseases in eastern Sudan (Agab, 1993). The condition in ostriches has been described as lowered (S-shaped) or curled neck occurring due to general ill-health or possibly micronutrient deficiency (Shanawany and Dingle, 1999).

The traditional treatment of this syndrome includes application of compress made of clay and hot water on the affected neck (Leese, 1927) or drenching the animal with a mixture of root and leaves of certain plants in Kenya (Kaufmann, 1998). In some camel keeping tribes in India, bleeding the animal from the jugular vein is practiced as a healing method (Rathore, 1986). However, the most commonly used traditional



Fig 1. Wry neck syndrome in an adult camel.

method in Sudan is to cauterise the animal on the neck region (Agab, 1998). Some of the camels investigated in this communication had recovered after firing but brought to the clinic seeking treatment for other complaints while others were fired for acute affection with wry-neck but sent shortly after that to the abattoir without being given enough time to allow for recovery.

The modern methods of treatment, on the other hand, include intramuscular injection of the animal with vitamin B₆ or Vitamin B complex (Gahlot and Chauhan, 1992) or drenching the animal with 1.5 kg of Epsom salt immediately after onset of the disease (Rathore, 1986).

However, a clinically similar condition referred to as torticollis (Wry neck) was described to occur in human beings (Craig *et al*, 2001). The possible causes of this condition in humans include muscular spasms or it can be secondary to a slipped facette, herniated disc or it can be due to a microbial infection.

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