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Survey for certain zoonotic diseases in camels in Sudan

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Une recherche des anticorps de *Coxiella burnetii*, *Toxoplasma gondii* et *Brucella abortus* a été effectuée sur les sérums de dromadaires abattus pour la consommation de viande dans un marché urbain du Soudan central. Les anticorps de la fièvre-Q ont été détectés chez 14,5 p. 100 des animaux, ceux de la toxoplasmose chez 12 p. 100 et de la brucellose chez 3 p. 100 des animaux. *Mots clés* : Dromadaire - Brucellose - Fièvre-Q - Toxoplasmose - Zoonose - Anticorps - Soudan.

INTRODUCTION

Camels in Sudan are raised by nomadic or transhumant societies who depend on milk and meat from these animals. Camel milk as well as camel liver are consumed raw, without any heat treatment. In addition, there is close contact between a herdman and camels on several occasions : during watering, riding, grooming and milking. Senile, debilitated or sick animals are often well nursed and hand-fed sometimes for long periods. These factors increase the contact between animal and man and may contribute to the transmission of some zoonotic diseases. In this paper, the results of a survey for three zoonotic diseases in camels, namely brucellosis, Q-fever and toxoplasmosis are presented.

MATERIAL AND METHODS

Sera

Blood was collected from 198 camels slaughtered at Tamboul, a camel-market town in central Sudan, as well as from 40 camels in Butana plains to the northeast of Khartoum. Serum was separated after clotting and was stored at -20 °C until used.

Serologic tests

Sera were tested for antibodies against *Brucella abortus* by the slide agglutination test and positive sera were titrated by the tube method (16). The capillary agglutination test for *Coxiella burnetii* antibodies was performed as described by LUOTO (5). Sera were screened for antibodies against *Toxoplasma gondii* by the indirect micro-haemagglutination test (10, 14) using a commercially available test-kit (*). In this test sera which gave positive agglutination (2+) at a dilution of 1:64 or higher were considered positive.

RESULTS

Antibodies against *Brucella abortus* were detected in 8 animals constituting a 3 p. 100 prevalence (Table I). Antibodies against *C. burnetii* were detected in 16 animals (14.5 p. 100); nine of seropositive animals were males and 7 were females. Eleven animals (12 p. 100) were positive for toxoplasmosis. Of these, 4 were males and 7 females. High serum antibody titres were recorded for the three diseases. Three toxoplasmosis positive animals had titres as high as 1:1,024, while in the rest of animals the range was 1:64 to 1:512. Brucellosis positive camels had titres ranging 1:256 and 1:512 while titres of antibodies to Q-fever

TABLE I Prevalence of antibodies against *Coxiella burnetii*, *Toxoplasma gondii* and *Brucella abortus* in camel sera.

	Number tested			Number positive (*)		Sample prevalence (*)
	Male	Female	Total	Male	Female	
<i>C. burnetii</i>	60	50	110	9(15)	7(14)	14.5
<i>T. gondii</i>	55	40	95	4 (7)	7(18)	12
<i>B. abortus</i>	120	118	238	4 (3)	4 (3)	3

(*) per cent.

(*) Canalgo Diagnostics, Rockville, Maryland, U.S.A.

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had a wide range ; the highest titre recorded in this study was 1:512 in one seropositive animal.

DISCUSSION

ABU-DAMIR *et al.* (1) reported brucellosis antibodies in 4.9 p. 100 of camels from different regions in the Sudan and observed an equal distribution of reactor animals between the two sexes. MUSTAFA and KARIM (9) reported a 3.5 p. 100 prevalence of brucellosis in camels in northern Sudan. The present investigation confirms that camels in the Sudan have a low prevalence of brucellosis. This could be due to the fact that camels are raised on extensive range without problems of overcrowding. Also during calving dromedary cows separate themselves from the herd and do not allow approach by other camels (11). This may lessen the chances of brucellosis transmission as parturition is the time when most of *Brucella abortus* contamination occurs. However, since camel milk is consumed without heat treatment, brucellosis should be considered as a public health hazard in camel rearing areas despite the low prevalence in camels. Toxoplasmosis in camels has been reported by several authors. Surveys in Egypt indicated a low prevalence rate (7), but a higher prevalence was found in camels from the north west desert area (6). However, SHARMA and

GAUTAM (13) reported infection rates of 11 to 19 p. 100 in camels in India. RIEMANN *et al.* (12) found evidence of *T. gondii* infection in twelve species of wild mammals in Africa and implicated wild cats as the most important disseminator of the infective stage of this parasite. In the arid regions of the Sudan, rodents, jackals and hyenas abound and the role of these animals in contaminating camel pastures with *T. gondii* and other parasites should be studied (8, 15). The high antibody titres detected in these camels could indicate active chronic infections. A high frequency of isolations of *T. gondii* has been made from animals with titres of 1:128 (15).

CONCLUSION

Q-fever in camels in the Sudan has been reported by HARBI and KARIM (4) in contrast to EL NASRI (3) who reported sero-evidence of the infection in cattle and goats only. ADDO (2) reported Q-fever in 12 p. 100 of Nigerian camels. Q-fever can be transmitted to man from freshly slaughtered animals or through the consumption of raw milk and butter. The relatively high prevalence of Q-fever in camels, particularly in those slaughtered for meat, emphasises the need to investigate its prevalence among herdmen as well as butchers in camel-market towns.

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A survey for *Coxiella burnetii*, *Toxoplasma gondii* and *Brucella abortus* antibodies was conducted on the sera of camels slaughtered for meat in a market town in central Sudan. Q-fever antibodies were detected in 14.5 p. 100 of the animals while toxoplasmosis antibodies were found in 12 p. 100 and brucellosis in 3 p. 100 of the animals. *Key words*: Camel - Brucellosis - Q-fever - Toxoplasmosis - Antibody - Zoonotic disease - Sudan.

ABBAS (B.), EL ZUBEIR (A. E. A.), YASSIN (T. T. M.). Encuesta sobre algunas zoonosis de los dromedarios en el Sudán. *Rev. Elev. Méd. vét. Pays trop.*, 1987, **40** (3): 231-233.

Se efectuó una búsqueda de los anticuerpos de *Coxiella burnetii*, *Toxoplasma gondii* y *Brucella abortus* en los sueros de dromedarios matados para el consumo de carne en un mercado urbano del Sudán central. Se evidenciaron los anticuerpos de la fiebre Q en 14,5 p. 100 de los animales, los de la toxoplasmosis en 12 p. 100 y los de la brucelosis en 3 p. 100 de los animales. *Palabras claves*: Dromedario - Brucelosis - Fiebre Q - Toxoplasmosis - Zoonosis - Anticuerpo - Sudán.

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