

رقم البحث (11)

STUDYING ON SEROPREVALENCE OF BRUCELLOSIS IN CAMEL IN SOMALILAND

*BY***Elnaker, Y. F; Elbeskawy. M. A.; Younis E.E. and *Waled, S. Shell***Faculty of Veterinary Medicine Mansoura University, Mansoura, Egypt*** Brucella unit, Central Laboratory Evaluation for Veterinary Biologics, Abbasia, Cairo.*

ABSTRACT

This study was carried out from November 2011 to October 2012 on 6763 dromedary camel in Berbera Veterinary quarantine admitted from four region in Somaliland, Somalia, to determine the seroprevalence of *Brucella abortus* in camel in Somaliland using RBPT and CFT, in relation to the area, age and season. The overall seroprevalence was 2.7 and 1.56%, by Rose Bengale Plate Test (RBPT) and Complement Fixation Test (CFT), respectively, the higher seroprevalence was found in August and March months as it reached 4.78% and 3.56%, respectively. The higher seroprevalence was observed in age group > 4 years old as it reached 6.12% followed by 2-4 years old 2.70%. by Rose Bengale test, in relation to the area, the higher seroprevalence was found in Hargesia by 3.94% and 2.78%, by RBPT and CFT respectively, while the lower seroprevalence was found in Buroa by 1.65% and 0.72% by RBPT and CFT, respectively. From this study we can conclude that, *Brucella* spp. exists within the camel herds in Somaliland. Due to the uncontrolled movements of different animals (camels, sheep and goats) through the borders between Somaliland and surrounding countries on which it is recommended to vaccinate the animals in Somaliland. Adequate *Brucella* control programs in small ruminants may contribute to the reduction in the prevalence of this disease in camel.

Keywords, Camel brucellosis, Brucella, CFT,

INTRODUCTION

In many developing countries of Asia and Africa, camels are considered to be one of the most important sources of income for the nomadic population. With increasing urbanization, camel milk and meat have gained a wider market and commercialization and consumption of camel products are on the rise. Camel brucellosis can be encountered in all camel rearing countries with exception of Australia. High animal and herd prevalence have been reported from numerous countries, which not only pose a continuous risk for human infection, but also increase the spread of infection through uncontrolled trade of clinically inconspicuous animals. **Sprague et al (2012)**

Somalia economy is largely depended upon livestock accounting for about 60% of the national income. Camel population is the largest in Africa; the number recorded being 6.3 million **Refai (2002)**

Brucellosis is a disease caused by varies species of the genus *Brucella* which is the most widely spread zoonosis worldwide **Dawood, (2008)**. The disease can affect almost all domestic species and cross transmission can occur between cattle, sheep, goat, camel and other species **Ghanem et al., (2009)**.

Brucellosis has great impact on economic development by affecting foreign market, apart from direct losses (morbidity and mortality) and indirect losses such as costs of treatment and ineffective control measures **Perry et al., (2001)**.

Brucellosis has considerable public health importance as owners consume raw camel milk **Gameel et al., (1993)**. The prevalence is higher in intensive camel production system where large herd size kept at close proximity in a farm. In extensive management system the prevalence is low **Abbas and Agab (2002)**. Non pregnant dromedaries experimentally infected with a field strain of *B. abortus* developed only mild, transient clinical symptoms including reduced appetite, slight lameness and bilateral lacrimation **Abu Damir et al., (1989)**. Orchitis and epididymitis have also been associated with brucellosis caused by *B. abortus* and *B. melitensis* **Tibary et al., (2006)**. Other conditions caused by the disease were retention of placenta, placentitis, uterine infections, fetal death and mummification, delayed maturity and infertility; it also caused arthritis and hygroma **Musa et al., (2008)**.

Camels are not known to be primary host for any of *Brucella* organisms but they are susceptible to both *B. abortus* and *B. melitensis* (**Teshome et al. (2003)** recorded 5.7 and

4.2% seroprevalence of brucellosis in camels kept in 3 arid and semi arid region of Ethiopia (Afar, Somali, Borana) using Rose Bengal Plate Test (RBPT) and Complement Fixation Test (CFT), respectively.

So the aim of this work was primarily directed to the investigation of the seroprevalence of *brucellosis* in camels in three districts in Somaliland.

MATERIAL AND METHODS

This study was conducted from November 2011 to October 2012 in the Berbera veterinary Quarantine in Somaliland, Somalia.

Animals:

6763 camels (*Camelus dromedaries*) were used for studying the prevalence of brucellosis in Somaliland and these camels were classified according to their age into four groups. Data about location, age and clinical status were reported.

The camels are.

Sampling:

About 10 ml of blood was collected from the jugular vein of each camel using plain vacutainer tube, the blood was allowed to clot for 1-2 hrs at room temperature, stored horizontally overnight at 4° C, then the serum was separated from the clot by centrifugation at 2000-3000 rpm for 10-15 minutes, the serum was labeled and stored at -20° C till tested.

Serological test:

Rose Bengal plate-agglutination test.

As a routine work in Berbera veterinary quarantine, the selected sera in consideration to locality, age and collection date were screened for antibodies against *Brucella* by the Rose Bengal plate-agglutination test (RBPT). Using RBPT antigen (CZV. Spain B. No. 102437), the test procedure recommended by **Alton et al (1988)**. Positive serum samples were kept for further examination by CFT.

Complement fixation test.

The selected serum were retested using tube agglutination Antigen (American) B. abortus S₉₉ antigen for CFT was used to detect the presence of anti-brucella antibodies in the sera. The test antigen obtained from veterinary serum and vaccine research institute Abbasia, Egypt, and the CFT was done at Brucella unit in Central Laboratory Evaluation for Veterinary Biologics, Abbasia, Cairo, Egypt. Sera with strong reaction, more than 75% fixation of complement (3+) at a dilution of 1:5 and at least 50% fixation of complement 2% at a dilution of 1: 10 and at dilution of 1: 20 were classified as positive samples (OIE 2004).

Statistical analysis

ANOVA test was used in Statistical studies.

RESULTS

Table (1): Monthly seroprevalence of camel brucellosis in camel admitted to Berebera veterinary quarantine.

Month	Total examined	Positive RBRT	%	Positive CFT	%
November2011	102	3	2.94	0	0
December 2011	411	7	1.70	5	1.21
January 2012	759	18	2.37	11	1.44
February	410	12	2.92	8	1.95
March	702	25	3.56	15	2.13
April	766	22	2.87	12	1.56
May	845	23	2.72	12	1.42
June	728	18	2.47	11	1.51
July	1150	29	2.52	18	1.56
August	167	8	4.78	6	3.59
September	395	11	2.78	4	1.01
October	328	7	2.13	4	1.21
Total	6763	183	2.70	106	1.56

* No significance p= 1 (p > 0.05)

6 - 9 September 2014

The overall seroprevalence of Brucellosis in camel was 2.7% in which 183 out from 6763 examined camels were positive by Rose Bengale Test, the higher seroprevalence were found in months of August and March, as it reached 4.78% and 3.56% respectively. While by confirmation using CFT the overall seroprevalence of brucellosis in camel were 1.56%, the higher seroprevalence were 3.56% and 2.13% in months august and march, respectively.

Fig. (1): Monthly seroprevalence of camel brucellosis in camel admitted to Berebera veterinary quarantine.

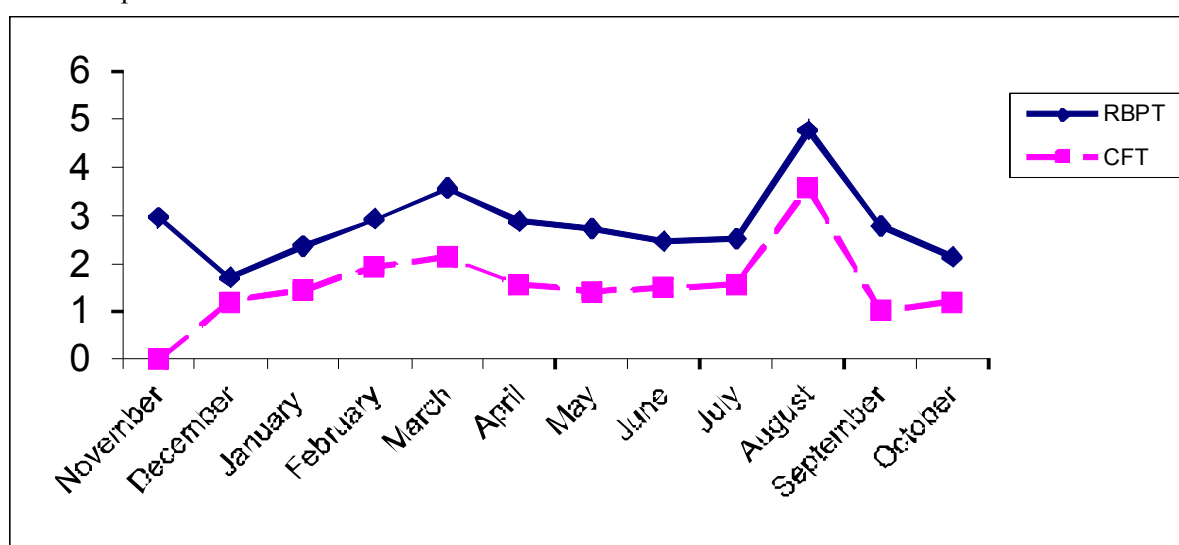
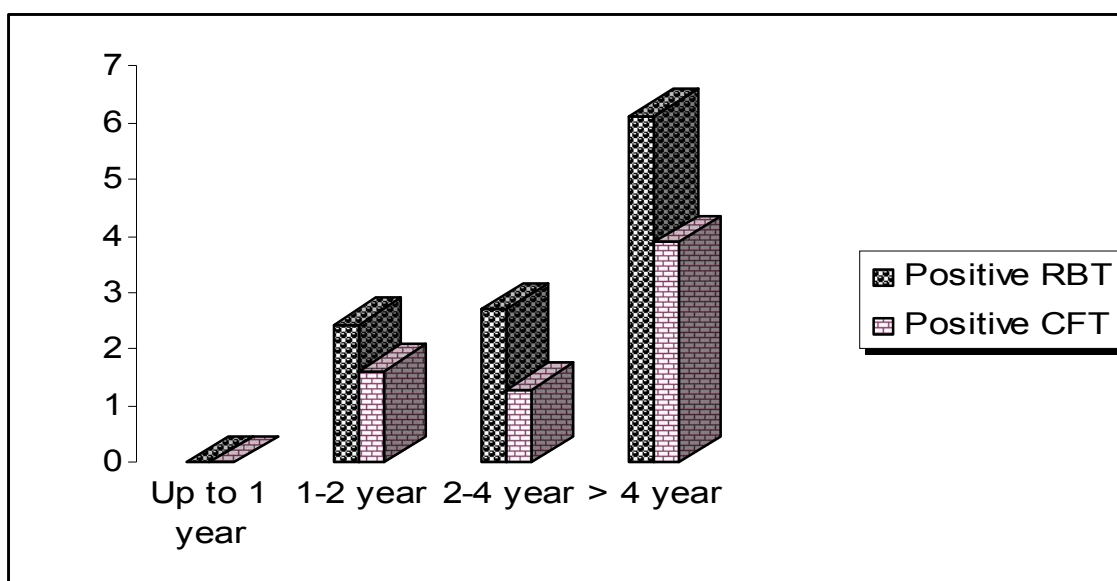


Table (2): Seroprevalence of brucellosis in camel according to age.

Age group	Total	Positive RBT	Positive CFT
Up to 1 year	1180	0	0
1-2 year	1728	42 (2.43%)	28 (1.620)
2-4 year	2777	75(2.70)	36 (1.29)
> 4 year	1078	66 (6.12)	42 (3.89)
Total	6763	183 (2.70)	106 (1.56%)

* No significance $p = 0.270$

The higher Seroprevalence according to age revealed that the higher seroprevalence observed was in age group > 4 years old as it reached 6.12% followed by 2-4 years old 2.70%. By confirmation by CFT the higher seroprevalence were found in (> 4 year) old group as it reaches 3.89%.

Fig. (2): Seroprevalence of brucellosis in camel according to age.**Table (3):** Seroprevalence of brucellosis in camel according to locality.

locality	Total	Positive RBT	Positive CFT
Hargesia	2154	85 (3.94%)	60 (2.78%)
Baiduko	2057	55 (2.67%)	26 (1.26%)
Beledwain	1040	18 (1.73%)	9 (0.86%)
Buroa	1512	25 (1.65%)	11(0.72%)
Total	67865	183 (2.70)	106 (1.56%)

According to locality the higher seroprevalence was found in Hargesia by 3.94% and 2.78%, by RBPT and CFT, respectively, while the lower seroprevalence was found in Buroa by 1.65% and 0.72% by RBPT and CFT, respectively.

DISCUSSION

In the present study the overall seroprevalence of *Brucellosis* in camel in somaliland was 2.7% in which 183 out from 6763 examined camels were positive by Rose Bengale Test, the higher seroprevalence was found in months of August and March as it reached 4.78% and 3.56% respectively. While by confirmation using CFT the overall seroprevalence of

brucellosis in camel were 1.56%, the higher seroprevalence were 3.56% and 2.13% in months of August and March, respectively. (**Table 1 & Fig 1**), Our result are agree with the result obtained with **Mohamed (2009)** who examined serum samples collected from 80 camels, 2 were positive by Rose Bengal Test (RBT).added that The prevalence of camel brucellosis in Sheikh District in Somaliland was (2.5%), therefore, the true prevalence of camel brucellosis in Sheikh District as adjusted to the RBT sensitivity and specificity was 2.87%. The result was lower than that recorded by. **Ghanem et al; (2008)** in Somaliland who investigated the prevalence and risk factors of camel brucellosis in Northern Somalia (Somaliland) in the period from July to November, 2008 he examined a total number of 1246 camel blood sera were randomly collected from 42 sporadic small scale camel herds. Two serological tests were used to screen all serum samples, Rose Bengal Plate Test (RBPT) and indirect ELISA, they added that the overall prevalence of camel brucellosis in districts under investigation were 3.9% by RBPT and 3.1% by (I-ELISA). However, higher prevalence was also recorded in Egypt (**Radwan et al.1995; El-Boshy et al. 2009**), Saudi Arabia (**Radwan et al. 1992**), and Sudan (**Yagoub et al. 1990**). Atmospheric conditions and seasons of the year might have influence on the management and contact of the infected and susceptible host. In dry areas, water resources were sparsely distributed (**Helland 1982**). As a result, the congregation of a large number of mixed ruminants at water points facilitated disease spread. The coincidence of parturition in wet Season (**Schwartz and Dioli, 1992**) enhances the viability of the organisms in the environment, thus increasing the chance of infecting susceptible animals (**Corbel, 1990**). **Baumann and Zessin (1992)** recorded higher brucellosis reactor rate in two wet seasons than dry seasons. The incidence of brucellosis in camel population appears to be related to breeding and husbandry practices. Herd sizes, density of animal population, and poor management were directly related to prevalence (**Wernery and Kaaden, 2002**)

On studying age, The higher Seroprevalence according to age revealed that the higher seroprevalence was observed in age group > 4 years old as it reached 6.12% followed by 2-4 year old 2.70%. By confirmation by CFT the higher seroprevalence were in > 4 year old group as it reaches 3.89%. **Table (2) & Fig (2)** the result are agreeable with **Radostits et al (2007)** who clarified that in Brucella infection, prevalence was increased with age, probably because of greater exposure to infection. Moreover, sexually mature animals were more prone to the infection than sexually immature animals of either sex and with **CDC, (2007)** which clarified that sex hormones and meso-erythritol (in male testicles and seminal vesicles) and

erythritol in female allantoic fluid stimulate the growth and multiplication of *Brucella* organisms and tended to increase in concentration with age and sexual maturity

By studying the locality (**Table 3**), the higher seroprevalence was found in Hargesia by 3.94% and 2.78%, by RBPT and CFT, respectively, while the lower seroprevalence was found in Buroa by 1.65% and 0.72% by RBPT and CFT, respectively, **Ghanem et al; (2009)** attributed the effect of locality on *Brucella* infection to the husbandry, management practice, absence of Vet. Services, lack of awareness, and uncontrolled movement of pastoralists from place to another. that finding was also supported by **Radostits et al; (2007)** who stated that the movement may worsen the epizootic situation of Brucellosis in any locality, because the spread of infection was almost always due to movement of infected animal to susceptible camel herd.

From this study we can conclude that, *Brucella abortus*. exists within the camel herds in Somaliland. Further studies are still needed to be done on *Brucella* infection in the other ruminants to determine which measure should be followed for control. Due to the uncontrolled movements of different animals (camels, sheep and goats) through the borders between Somaliland and surrounding countries, it is recommended to vaccinate the animals in Somaliland at regular intervals especially along the borders of the country. Adequate *Brucella* control programs in small ruminants may contribute to the reduction in the prevalence of this disease in camels.

REFERENCES

- Abbas, B. and H. Agab, (2002):** A review of camel brucellosis. *Prev. Vet. Med.*, 55: 47-56.
- Abu Damir H., Tageldin M.H., Kenyon S.J. Idris O.F. (1989):** Isolation of *Brucella abortus* from experiment - tally infected dromedary camels in Sudan: a preliminary report. *Veterinary Research Communications*, 13, 403–406.
- Alton, G. G.; Jones, L. M.; Angus R. D. and Verger, J. M. (1988):** Technique for the Brucellosis Laboratory, INRA publication, Versailles Cedex, France.
- Baumann, M. P. O. and Zessin, K. H. (1992):** Productivity and health of camels (*Camelus dromedarius*) in Somalia: Associations with trypanosomosis and brucellosis. *Tropical Animal Health and Production* 24, 145-156.
- Center for Disease Control and Prevention (CDC), (2007):** Brucellosis. Available at http://www.cdc.gov/ncidod/dbmb/diseaseinfo/brucellosis_t.htm. Accessed on March, 2008
- Corbel, M. J. (1990):** *Brucella*. In: M.T. Parker and B.I. Duerden (eds). *Topley and Wilson's Principles of Bacteriology, Virology and Immunology*. 8th ed Vol. 2 London: Edward Arnold, pp 341-351
- Dawood, H.A., (2008):** Brucellosis in camels (*Camelus dromedarius*) in the south province of Jordan. *Am. J. Agric. Biol. Sci.*, 3: 623-626.
- El-Boshy, M., Abbas, H., El-Khodery, S., Osman, S., (2009):** Cytokine response and clinicopathological findings in *Brucella* infected camels (*Camelus dromedarius*). *Veterinari Medicina* 54, 25–32
- Gameel, S.E.A.M., S.O. Mohamed, A.A. Mustafa and S.M. Azwai, (1993):** Prevalence of camel brucellosis in Libya. *Trop. Anim. Health Prod.*, 25: 91-93.
- Ghanem YM, El-Khodery SA, Saad AA, Abdelkader AH, Heybe A, Musse YA.(2009):** Seroprevalence of camel brucellosis (*Camelus dromedarius*) in Somaliland. *Trop Anim Health Prod.*; 41(8):1779-86
- Helland, J. (1982):** Social organization and water control among the Borena of southern Ethiopia. *Development and Change* 13, 239-258.

- Mohamed Hassan Barre (2009):** Study on prevalence of camel brucellosis in sheikh district. Thesis for Diploma in Livestock Health Science. Sheikh Technical Veterinary School
- Musa, M.T., Eisa, M.Z., M El Sanousi, M., Abdel Wahab, E.M., Perrett, L., (2008):** Brucellosis in Camels (*Camelus dromedarius*) in Darfur, Western Sudan. *Journal of Comparative Pathology* 138, 151–155.
- OIE, (2004):** Manual of diagnostic Tests and vaccines for Terrestrial Animals 5th ed. Office international des Epizootics, Paris, Pp 409 - 438
- Perry, B., J. McDermott and T. Randolph, (2001):** Can epidemiology and economics make a meaningful contribution to national animal-disease control. *Preventive Vet. Med.*, 48: 231-260.
- Radostits, O.M., C. Gay, D.C. Blood and K.W. Hinchclift, (2007):** Brucellosis In: veterinary medicine, a text book of the disease of cattle, sheep, goat, pigs and horses. 10th ed. London: Bailliere, Tindall, UK, pp: 984-988.
- Radwan, A. I., Bekairi, S. I., Mukayel, A. A., Al-Bokmy, A. M., Prasad, P. V. S., Azar, F. N., Coloyan, E. R., (1995):** Control of *Brucella melitensis* infection in a large camelherd in Saudi Arabia using antibiotherapy and vaccination with Rev. 1 vaccine. *Revue Scientifique et technique*, 14, 719–732
- Radwan, A.I., S.I. Bekairi and P.V. Prasad, (1992):** Serological and bacteriological study of brucellosis in camels in central Saudi Arabia. *Rev. Sci. Tech.*, 11: 837-844.
- Refai, M., (2002):** Incidence and control of brucellosis in the Near East region. *Veterinary Microbiology*, 90, 81–110. doi:10.1016/S0378-1135(02)00248-1
- Schwartz, H.J. and Dioli, M. (1992):** The One-Humped Camel in Eastern Africa: A Pictorial Guide to Diseases, Health Care and Management. Weikersheim: Verlag Josef Margraf, pp. 1 – 59
- Sprague LD, Al-Dahouk S, Neubauer H. (2012):** A review on camel brucellosis: a zoonosis sustained by ignorance and indifference. *Pathog Glob Health*. 2012 Jul; 106(3):144-9.
- Teshome H, Molla B, Tibbo M. (2003):** A seroprevalence study of camel brucellosis in three camel-rearing regions of Ethiopia. *Trop Anim Health Prod*. 35(5):381-90

- Teshome, H., B. Molla and M. Tibbo, (2003):** A seroprevalence study of camel brucellosis in 3 camel-rearing regions of Ethiopia. *Trop. Anim. Health Prod.*, 35: 381-390
- Tibary, A., Fite, C., Anouassi, A., Sghiri, A., (2006):** Infectious causes of reproductive loss in camelids. *Theriogenology* 66, 633–647.
- Wernery, U. and Kaaden, O. R. (2002):** *Infectious Diseases of Camelids*. London: Blackwell Science Inc., pp. 99 – 116.
- Yagoub I.A., Mohamed A.A., Salim M.O. (1990):** Serological survey of *Brucella abortus* antibody prevalence in the one-humped camel (*Camelus dromedarius*) from eastern Sudan. *Revue D'élevage et de Medecine Veterinaire des Pays Tropicaux*, 43, 167–171.

الملخص العربي

دراسة سيرولوجية عن الإصابة بالبروسيلة في الإبل في أرض الصومال

ياسر الناقر & محمد البسكاوي & عماد يونس & وليد سعد

كلية الطب البيطري جامعة المنصورة

*وحدة البروسيلة المعمل المركزي للرقابة علي المستحضرات البيولوجية العباسية – القاهرة

أجريت هذه الدراسة في محجربيرة البيطري في أرض الصومال علي مدار عام في الفترة من نوفمبر ٢٠١١ إلى أكتوبر ٢٠١٢ لتحديد نسبة الإصابة بالبروسيلة في الإبل في أربعة مناطق مختلفة في أرض الصومال باستخدام اختبار RBPT وتأكيدا باستخدام اختبار CFT ، حيث قسمت الجمال حسب اعمارها الي ثلاث مجموعات (مجموعة من ٦ اشهر الي سنة & مجموعة من ٢-٤ سنوات & مجموعة اكبر من ٤ سنوات) حيث تم تجميع عينات سيرم من ٦٧٦٣ جمل وتم فحصها باستخدام اختباري CFT & RBPT وبلغت النسبة الكلية للإصابة ٢,٧٪ (١٨٣ جمل من اجمالي ٦٧٦٣ جمل تم فحصها) باستخدام اختبار Rose Bengale ووجدت اعلي اصابة في أشهر أغسطس ومارس حيث وصلت نسبة الإصابة إلى ٤,٧٨٪ و ٣,٥٦٪ على التوالي. بينما باستخدام CFT بلغت نسبة الإصابة الكلية في الإبل بنسبة ١,٥٦٪ ، وكانت أعلى نسبة اصابة ٣,٥٦٪ و ٢,١٣٪ في شهري أغسطس ومارس علي التوالي. وبالنسبة للعمر كانت اعلي نسبة اصابة في المجموعة العمرية الاكبر من ٤ سنوات من العمر حيث ان نسبة الإصابة وصلت الي ٦,١٢٪ تليها المجموعة من ٢-٤ سنة بنسبة ٢,٧٠٪. وكانت اعلي نسبة اصابة في منطقة برعو حيث وصلت نسبة الإصابة الي ١,٦٥٪

ومن هذه الدراسة يتضح اهمية مرض البروسيلة في المناطق التي اجريت بها الدراسة وتحتاج الي مزيد من الدراسة في الحيوانات المختلفة للسيطرة علي مرض البروسيلة.