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Survey of Brucellosis among Sheep, Goats, Camels and Cattle in Kassala Area, Eastern Sudan

Mokhtar, M. Omer, Abdelhamid A. Abdelaziz, Sarah, M.A. Abusalab and Abbas M. Ahmed
Laboratory of Kassala Veterinary Research, Animal Resources Research Corporation,
Ministry of Science and Technology, Sudan

Abstract: This study is conducted to estimate the prevalence of brucellosis in different animals species in Kassala area, eastern Sudan during 2004 up to 2006. The study aimed to provide a documented information on the prevalence of the disease with a view to assisting veterinary authorities in diseases control policies and planning research priorities in the region. The serum samples were collected from sheep, goat, camels and cattle, then tested in by Rose Bengal Plate test. The study showed that the prevalence of brucellosis is increased during the last years among different animal species.

Key words: Brucellosis, sheep, goats, camels, cattle ,species

INTRODUCTION

Sudan is the largest Arab and African country, it is surrounded by nine countries and it is divided into 26 states one of them is Kassala. It is possesses a great livestock population approximately 43 million animal units. This livestock is threatened by many contagious diseases one of them is brucellosis. Brucellosis is a contagious disease of animals which is transmitted to man. It is caused by species of the genus *Brucella*. The disease is widely spread in many parts of the world particularly the Mediterranean and the Middle-Eastern Countries (Corbel, 1997). Up to the present time, brucellosis remains a major problem of public health in many countries which have promoted change from traditional to intensive methods of dairy farming (Abu-Eisha, 2000). The disease is caused by members of the genus *Brucella*. The primary hosts act as reservoirs of infection for each particular species, while the secondary ones usually play little part in the maintenance or spread of the disease (Corbel and Hendry, 1983). In females this infection extends to the placenta and fetal tissues often producing abortion in pregnant animals.

In Sudan cattle brucellosis was reported in all parts of the country and the prevalence rate was found to be higher compared to other animal species. The first incidence of bovine brucellosis was reported from a dairy herd in Khartoum where *Br. abortus* was isolated from an aborted cow (Bennett, 1943). In eastern Sudan camel brucellosis was firstly reported by Mustafa and Nur (1968) in Gash and Toker, the prevalence was ranged between 0.1 and 5.5%. In Kassala and Butana areas Mustafa and El Karim (1971) examined 310 camels sera and reported 1.75 and 5.7% prevalence rates. Bitter (1986) examined 948 camels from different herds in eastern Sudan and reported a prevalence rate that ranged between 16.5 and 32.3%. *Br. abortus* was isolated from camel in this area (Agab *et al*., 1996; Omer, 2006).

Several serological tests used for diagnosis of brucellosis using body fluids such as sera, hygroma fluids, milk, vaginal mucus, semen, bursa and muscle juices. These tests include Rose Bengal Plate Test (RBPT), Serum Agglutination Test (SAT), Complement Fixation Test (CFT), Card test, Plate Agglutination test, modified SAT, Coombes test, Indirect Haemolysis Test (IHLT), Haemolysis in Gel Test (HIGT), Milk ring test (MRT), Whey Agglutination Test (WAT) and ELISA (WHO, 1992).

MATERIALS AND METHODS

Area of study: Kassala State which was chosen for the study lies between Latitudes 14°15′ and 17°15′ N and Longitudes 34°30′ and 37°E′ in eastern Sudan, it borders Eriterea and Ethiopia. The total animal population in this state according to the Administration of Animal Resources is 3800553, animal species is as follows: 1457643 sheep, 1122073 goats, 588880 camel and 631957 cattle. The survey was conducted during 3 years between January 2004 up to December 2006.

Corresponding Author: M.A. Abusalab, Kassala Veterinary Research Laboratory, Animal Resources Research Corporation, Ministry of Science and Technology, Sudan

Collection of samples: Samples were collected from sheep, goats, camels, and cattle. All serum samples were left in room temperature until separated from clotted blood directly and then examined. All these samples were collected from non-vaccinated animals.

Examination of samples: The study has been conducted in Kassala veterinary research lab. All serum samples were screened for brucellosis by Rose Bengal Plate Test (RBPT). The RBPT reagent is obtained from Central Veterinary Research Lab (CVRL), Soba, Khartoum.

RESULTS

A total of 346553 serum samples were collected from different animals as follows: 261787 from sheep, 69700 from goats, 14372 from camel and 694 from cattle. The percentage of the positive brucellosis sera during 2004, 2005 and 2006 was found to be as follows: 0.1, 0.4 and 2.1% (Mean = 0.9%) in sheep sera, 0.2, 0.6 and 5.6% (Mean = 2.1%) in goats sera, 12.3, 15.5 and 30.5% (Mean = 19.4%) in camel sera and 5.1, 10.6 and 17.1% (Mean = 10.9%) in cattle sera (Table 1 and Fig. 1).

Table 1: The percentage of positive brucellosis in serum samples from different animal species in Kassala area

Period	Animal sp.	Sheep	Goat	Camel	Cattle
2004	Total samples	61266	2903	4791	118
	Positive samples	66	5	590	6
	%	0.1%	0.2%	12.3%	5.1%
2005	Total samples	110492	36101	6032	254
	Positive samples	433	200	934	27
	%	0.4%	0.6%	15.5%	10.6%
2006	Total samples	100029	30696	3549	252
	Positive samples	2060	1733	1081	43
	%	2.1%	5.6%	30.5%	17.1%
Mean	%	0.9%	2.1%	19.4%	10.9%

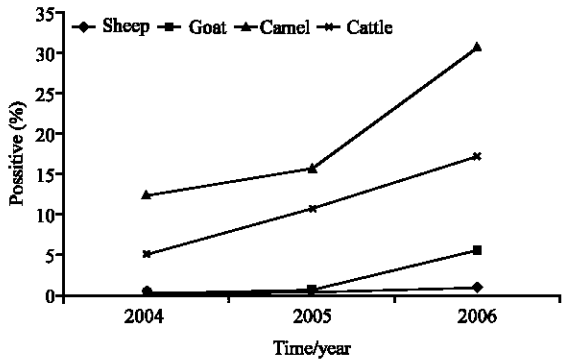

Fig. 1: The percentage of positive brucellosis in serum samples from different animal species in Kassala area

DISSCUSION

In this study RBPT was conducted because of the huge number of the samples. This test is widely used as a screening test (Morgan *et al*., 1969) also it can detect IgG_1 and IgM isotypes in bovine, sheep and goat sera and diagnosed the acute and chronic forms of the disease (WHO, 1993). The RBPT is easy to perform, cheap and rapid, it is more sensitive, but less specific than SAT and CFT. Sera negative for RBPT are not tested further (Morgan *et al*., 1978). Sudan exports sheep, goats and camels to many countries specially Saudi Arabia and other Arab Gulf countries. The number of the tested animals in different species is depends on this exportation movement. All the cattle samples were collected from individuals farms that is why the number of them were few comparable to the number of the other samples. The results showed that the prevalence rates of brucellosis in camel and cattle is higher than in sheep and goats. This may be due to the sex of the tested animals according to export movement, in case of camel and cattle both male and female samples were tested but in case of sheep and goats only males were tested. Previously Yagoub *et al*. (1990) found that the incidence rate in females is higher than in males.

Also this study showed that the prevalence rates of brucellosis is increasing in this area when it is compared with a previous study done by Elansary *et al*. (2001) who found 1% in sheep, 4% in goats, 0% in camel and 5% in cattle. This increasing is due to the continuous migration of nomads from South to North in the wet season and vice versa in the dry. Nomadic animals inter-mix freely and share common water points, pastures and routes (Omer, 2006). Another reason that the infected animals is not excluded and remained trying to treat it so they spread the infection through the herd. This reaearch indicates that brucellosis is still representing a big problem that affect the domestic animals in this part of the Sudan, that agree with Damir *et al*. (1984) who examined 740 camels in eastern, western and central Sudan and found the prevalence rate to be the highest in the eastern region. We recommend to increase the awareness of the animal owners, nomads, and abattoir workers, also a vaccination program of different animals in all over the country is strongly recommended.

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