

Prevalence of ovine brucellosis in sheep export in Berbera Somaliland

Abstract

In this study, a cross-sectional study was carried out from December 2016 to June 2017 to evaluate the prevalence of ovine brucellosis in Somali sheep intended for export in Berbera Somaliland. Serum samples from 400 sheep were collected and analyzed using Rose Bengal plate test. A full of 400 serum samples collected from different sheep herds in different districts, 345 (86.25%) of them were male and 55 (13.75%) were female. Out of the 400 serum samples 2(0.5%) positive for brucellosis by the Rose Bengal plate (RBPT). According to the sex, the prevalence of the disease was 2 (0.57%) in males and no positive sample observed in females. There were also some clinical signs of sheep brucellosis in all animals of the study samples such as history of abortion there was five aborted although there were serologically no positive samples. We conclude that the prevalence of ovine brucellosis according to the serological diagnosis is prevailing in Berber district at a low rate; and also the reproductive health problem such as orchitis and infertility is low. For recommendation, further surveys are required to investigate the sheep brucellosis in the production states and local slaughtered animals. However, more studies investigating potential risk factors that could enhance the spread and transmission of brucellosis in sheep in Somaliland are warranted. Also controlling, managing and eradicating the disease at this low prevalence should be a priority as it will take only a small effort and cost.

Keywords: brucellosis, prevalence, health, Somali blackhead sheep, Somaliland

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Abbreviations: RBPT, rose bengal plate test; SPSS, statistical package social science

Introduction

Ovine brucellosis was distinguished by abortions in ewes and epididymitis, orchitis and reduced fertility in rams is because of the infection of *Brucella ovis*. The main portal entry for this bacterium is oral, by the ingestion of feed and water, which is contaminated with secretions or aborted foetal remains from infected sheep or by licking the vaginal secretions, genitals, aborted fetus or newborn lambs of infected ewes.¹ Its prevalence varies widely from one country to another, the epidemiology and the control of brucellosis have been studied extensively worldwide.² However, more than 500,000 human cases of brucellosis are reported yearly.³

Diagnosis of brucellosis can be done either directly by bacterial isolation or indirectly by the use of serological tests such as RBPT, Tube agglutination test (T.A.T.), Complement fixation test (C.F.T.) and ELISA.⁴ In Somaliland (North Somalia) FAO⁵ recorded that *B. abortus* infection was suspected of being present in cattle and that *B. melitensis* infection was widespread in sheep and goats. The source of revenue of the pastoralists in these areas chiefly depends on their livestock, and therefore, the disease could impose a tremendous economic failure due to reproductive expenditure such as infertility, and abortion.

The objective of the current research was to give to knowledge necessary to reach this planned aim:

- To evaluate the prevalence of Ovine brucellosis in Somali sheep intended for send abroad in Berbera Somaliland.
- To determine any reproductive health problems.

Materials and methods

Research area

Berbera district which is located in coastal northwestern Somaliland is the study area of this research. The district was located between latitude 10°26'N and longitude 43°02' E. The climate is desert or semi-desert. It has long, very hot summers and short, hot winters, as well as very little rainfall. Average high temperatures consistently exceed 40 °C (104 °F) during nearly four months of summertime (June, July, August, and September). Daytime heat on summer nights is high, with average low temperatures of around 30 °C (86 °F). During the coolest months of the year, average high temperatures remain above 29 °C (84.2 °F) and average low temperatures also surpass 20 °C (68 °F). The annual average rainfall is minimal, with only 52 mm (2.05 in) of precipitation. The main sheep breeds Berbera Blackhead sheep.⁶

Study population

The study population consisted of sheep which were chiefly intended for export to the abroad countries such as Saudi Arabia, Yemen, Oman, and Jordan, etc. The sheep under study comprised both sexes (although internationally only male animals were exported but in Somali due to the wars all sexes were exported) and different age groups were included in the study.

Sampling method

In this study cluster, random sampling was used due to the purpose of keeping the animals.

Study design

In this study, a cross-sectional study was carried out from December 2016 to June 2017 to evaluate the prevalence of ovine brucellosis in Somaliland sheep intended for export in Berbera Somaliland.

Sample the size

The study was conducted in Berbera quarantine, and the information was collected from (400) sheep samples. They were divided into 8 herds of different age groups namely; one herd less than 1 year, four herds between 1-2 years and the other three herds were more than 3 years.

Sample collection

Purposively selected districts of four hundred sera samples (400 of sheep) were randomly collected. Three to six ml of blood was collected from the jugular vein of apparently healthy sheep using plain Vacutainer tubes with needles. Every tube was assigned by numbers and alphabets (like A1) to show their origin. The tubes were gone tilted one night at room temperature to permit clotting. Sera were then removed from the clot and were transported to Somaliland National Veterinary Diagnostic and Research Laboratory in an icebox and stored at -20°C until serological testing was complete.

Serological tests

Rose Bengal plate test (RBPT)

Brucella colored antigen used in this test was donated by Division of Brucella research in Veterinary Research Institute (VRI) Soba, the antigen and the method were done as described by Alton.⁷ The antigen and the serum samples were removed from the refrigerator to room temperature and shaken accurately before use. The same quantity of serum sample and Rose Bengal Plate Taste antigen (20 μl) were taken on an enamel plate, mixed thoroughly with rod stick and rotated left and anti-right. The result was read immediately after 5 min. Exact agglutination was measured as a positive reaction. Agglutination comes out as weakly positive, positive, strong positive or very strong positive. Results of Rose Bengal Plate Taste were read as 0, +, ++, and +++ as it has been described by Nielsen,⁸ with 0 : there is no agglutination; + : just visible agglutination (seen using magnifying glasses); ++ : well agglutination; and +++ : coarse agglutination. Those samples with no agglutination (0) were recorded as negative while those with +, ++, and +++ were recorded as positive.

Data analysis

Data from the study were stored into a computer on a Microsoft Excel Spreadsheet. Categorical variables were showed in percentages (%). The prevalence was designed as the number of animals tested positive by the RBPT, divided by the total number of tested animals. The analysis was performed using SPSS version 20. A value $p < 0.05$ was taken as significant and a value of $p > 0.05$ was taken as non-significant.

Result

This study was designed to evaluate the Assessment of Ovine Brucellosis in sheep intended for export in Berbera district. The prevalence of ovine brucellosis in the study was 0.5%. A full of 400 serum samples collected from different sheep herds in different districts, 345 (86.25%) of them were male and 55 (13.75%) were female (Table 1). In table 2, out of the 400 serum samples 2(0.5%) positive for brucellosis by the Rose Bengal plate (RBPT). According to the sex for keeping the animals, the positive samples were 2 (0.57%) were Male in animals prepared for live export by RBPT and SAT, while there were no positive serum samples in Female animals (Table 2). As regards to the Age, 1 (0.8%) of one to two years old were

positive and 1 (0.54%) of more than three years old were positive by RBPT and SAT (Table 2). According data for history of abortion, there were five aborted and fifty of not aborted females but there is no positive one (Table 2). In table 2, the reproductive health problems 2(0.5%) and 2(0.5%) of orchitis and infertility was found out of 400 animals.

Table 1 The characteristic features of the sample size

Unit	Frequency	Percentage
Sex		
Male	345	86.25
Female	55	13.75
Age		
<1year	90	22.5
1-2year	125	31.25
>3	185	46.25

Table 2 Seroprevalence of ovine brucellosis by RBPT

Unit	Total	Positive	Percentage (%)
Total	400	2	0.5
Sex			
Male	345	2	0.5798
Female	55	0	0
Age			
<1year	90	0	0
1-2year	125	1	0.8
>3	185	1	0.54
History of abortion			
Aborted	5	0	0
Not aborted	50	0	0
Orchitis	400	2	0.5
Infertility	400	2	0.5

Discussion

In this current finding, the prevalence of Ovine brucellosis in sheep is lower than the study conducted by Andreani et al.,⁹ who examined 250 sheep from Mogadishu and Kismayo abattoirs reserved on free-range in the South of the country (Upper and Lower Jubba and Benadir regions). This result was lower with the report done by Teshale et al.,¹⁰ in the Somali region, who finds the prevalence of brucellosis in sheep and goats, respectively. On the other hand, the prevalence recorded in this study was relatively lower than the finding by Ashenafi et al., (2007), who observed prevalence rates of 3.2% in sheep and 5.8% in goats in the pastoral areas of Afar region. This study showed that the

prevalence of ovine Brucellosis in Berbera district was 0.5% by RBPT and lower than the prevalence of sheep brucellosis in Khartoum state in Sudan which is 0.74% by RBPT and SAT Mohamed & Atif.¹¹ This finding cannot be completed over all the states because of the minute sample size and without used confirmatory test.¹²

Conclusion

We conclude that the prevalence of ovine brucellosis according to the serological diagnosis is prevailing in Berber district at a low rate and also the reproductive health problem such as orchitis and infertility is low. For recommendation, further surveys are required to investigate the sheep brucellosis in the production states and local slaughtered animals. More studies investigating potential risk factors that could enhance the spread and transmission of brucellosis in sheep in Somaliland are warranted. Also controlling, managing and eradicating the disease at this low prevalence should be a priority as it will take only a small effort and cost.

Acknowledgements

None.

Conflicts of interest

Author declares that there are no conflicts of interest.

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