Dedication

To my mother and father

To my sisters and my brother

To my teachers

To my friends and my colleagues

To each person who help me through this research

I dedicate this research hoping that it will find the acceptance and success

Acknowledgments

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List of Abbreviation

FAO	Food and Agriculture organization
WHO	World Health Orgnization
OIE	Office International des Épizooties
RBT	Rose Bengal test
RBPT	Rose Bengal Plate test
m- RBPT	Modified Rose Bengal Plate test
SAT	Serum agglutination test
CFT	Complement fixation test
ELISA	Enzyme Linked Immunosorobent Assay
C-ELISA	Competitive -Enzyme Linked Immunosorobent Assay
I- ELISA	Indirect- Enzyme Linked Immunosorobent Assay
PCR	Polymerase chain reaction
PCR-RFLP	PCR -Restriction fragment length polymorphism
FPA	Fluorescent polarization assay
MRT	Milk ring test
TAT	Tube agglutination test
BAPAT	Buffer acidified plate antigen test
MAT	Micro agglutination test
CT	Card test
DCs	Dendritics cells
2ME	2-mercaptoethanol test
STAT	Standard tube agglutination test
Rive-T	Rivanol test
IS711	Insertion sequence 711
RR	Relative risk
P	Prevalence
X^2	Chi-square
OR	Odd ratio
95% CI	95% confidence interval
LGA	Local governorate area
N	Number
UK	United Kindom
VLA	Veterinary Laboratories Agency
OD	Optical density
IU	International unit

Abstract

A cross sectional study on caprine brucellosis was conducted in April and May 2012 in Khartoum State, Sudan. A total of 307 goats were selected using multi-stage sampling method. The samples were diagnosed using three serological tests; Rose Bengal plate test (RBPT) as screening test, to detect the *brucella* serpositivity, and then the positive samples were tested by serum agglutination test (SAT) to measure the antibody titers, and confirmed by competitive Enzyme Linked Immunosorobent Assay (C-ELISA). A questionnaire was also applied to obtain information on the owner characteristics, individual animal characteristics, and management practices. The results showed a seroprevalence of 11.4% (35/307) by RBPT. Out of these 35 positive samples 18 (51.4%) were confirmed by SAT with titer more than 50 IU/ml and 17 (48.6%) were confirmed by C-ELISA.

Out of 23 variables screened in the univariable analysis using the Chi-square test, only 11 variables were significant with p-value ≤ 0.25. The variables that had a significant association with seropositivity of caprine brucellosis were: locality (X^2=9.33, p-value=0.025), owner age (X^2=1.64, p-value=0.199), education level (X^2=3.55, p-value=0.169), breed (X^2=3.52, p-value=0.061), herd size (X^2=6.59, p-value=0.037), history of abortion (X^2=2.29, p-value=0.130), history of retained placenta (X^2=1.51, p-value=0.218), source of feed (X^2=5.56, p-value=0.062), animal origin (X^2=5.39, p-value=0.020), veterinary services (X^2=2.32, p-value=0.127), and fetal membrane disposal (X^2=1.46, p-value=0.227).

These factors were considered for further analysis using Forward Logistic Regression analysis, and the final model revealed only three variables with p-values ≤ 0.05. There is a significant higher risk (p-value=0.020) within cross breed, cross breeds had a higher prevalence percentage (13.7%) compared to local breeds (6.3%). A significantly (p-value=0.020) higher prevalence of brucellosis was recorded in animal raised on farms (13.3%) than those purchased from outside (2.0%). Similarly, brucellosis seropositivity significantly increased (p-value=0.026) when owners didn't dispose fetal membranes (21.4%) compared to those who disposed fetal membranes (10.9%).

The results of this study showed that caprine brucellosis is distributed throughout all localities of Khartoum State, and this may increase the possibility of spread of the disease in the future. Also the risk factors which play a major role in the spread of the disease should be considered when it comes to implement control and prevention strategies.

Arabic Abstract

ملخص الدراسة

أجريت دراسة مقطعية لداء البروسيلا في الماعز بين شهري أبريل ومايو ٢٠١٢ في ولاية الخرطوم، السودان .وقد تم اختيار ما مجموعه ٣٠٧ ماعز، وتم أخذ العينات باستخدام طريقة متعدد المراحل. تم تشخيص العينات باستخدام ثلاثة اختبارات مصلية وهي : الفحص باستخدام لوحة اختبار الروز بنغال (RBPT) للكشف عن ايجابية البروسيلا، واختبار التراص المصلي في الأنابيب (SAT) لقياس مستوى الأجسام المضادة ، ومن ثم تم تأكيد العينات الإيجابية باستخدام اختبار الاليزا تنافسية الفحص (C-ELISA). تم تطبيق الاستبيان أيضا للحصول على معلومات عن خصائص مالك الحيوان، وخصائص الحيوان الفردية، والممارسات الإدارية. أظهرت النتائج وجود الانتشار المصلي بنسبة ١١,٤٪ (٣٥/٣٠٧) باستخدام لوحة اختبار الروز بنغال (RBPT). من اصل ٣٥ عينه موجبه ١٨ (٥١,٤٪) تم تأكيدها باستخدام اختبار التراص المصلي في الأنابيب (SAT) مع مستوى أجسام مضادة أكثر من ٥٠ وحدة دولية/ مل، و١٧ (٤٨,٦٪) تم تأكيدها باستخدام اختبار الاليزا تنافسية الفحص(C-ELISA). من أصل ٢٣ عامل خطر تم فحصه في تحليل المتغيرات الأحادية باستخدام اختبار الفرضية الإحصائية (chi-square)، لم تظهر النتائج سوى ١١ عامل خطر بنسبة دلالة إحصائية ≤ ٠,٢٥(P-value ≤ 0.25). والمتغيرات التي كان لها ارتباط مهم مع ايجابية داء البروسيلا في الماعز هي : المحليات (X^2=9.33, p-value=0.025)، عمر مالك الحيوان (X^2=1.64, p-value=0.199)، المستوى التعليمي (X^2=3.55, p-value=0.1)، السلالة (X^2=3.52, p-value=0.061)، وحجم القطيع (X^2=6.59, p-value=0.037)، وجود تاريخ بالإجهاض (X^2=2.29, p-value=0.130)، وجود تاريخ باحتباس المشيمة (X^2=1.51, p-value=0.218)، ومصدر الغذاء للحيوان (X^2=5.56, p-value=0.062) و منشأ الحيوان (X^2=5.39, p-value=0.020)، توفر الخدمات البيطرية (X^2=2.32, p-value=0.127)، والتخلص من الأغشية الجنينية (X^2=1.46, p-value=0.227).

أدرجت هذه العوامل لمزيد من التحليل باستخدام التحليل الانحداري اللوجستي الأمامي، والنموذج النهائي اظهر فقط ثلاثة عوامل خطر بنسبة دلالة إحصائية ≤ ٠,٠٥(p-value ≤ 0.05). هنالك تزايد إحصائي (p-value=0.020) في نسبة الخطر بين السلالات المهجنة. أن السلالات المهجنة تحتوي على أعلى نسبة انتشار من العينات (١٣,٧٪) مقارنة بالسلالات المحلية (٦,٣٪). من ناحية إحصائية (p-value=0.020) اعلي معدل انتشار للبروسيلا قد سجل في الحيوانات التي تمت تنشئتها في المزارع (١٣,٣٪) من تلك التي تم شرائها من الخارج (٢٪). وبالمثل فإن الاستجابة المصلية للبروسيلا قد زادت إحصائيا بشكل ملحوظ (p-value=0.026) عندما لم يتخلص مالكي الحيوانات من أغشية الجنين

(٢١,٤٪) مقارنة مع أولئك الذين تخلصوا منها (١٠,٩٪). وأظهرت نتائج هذه الدراسة أن داء البروسيلا منتشر في جميع محليات ولاية الخرطوم، وهذا قد يزيد من إمكانية انتشار المرض في المستقبل. أيضا عوامل الخطر تلعب دورا رئيسيا في انتشار المرض، ولذلك يجب أخذها في الحسبان عند تنفيذ استراتيجيات الوقاية والسيطرة.