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Sero-prevalence of Brucellosis in Humans and their Animals: A Linked Cross-sectional Study in Two Selected Counties in Kenya

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Objective

We determined the sero-prevalence and risk factors for brucellosis in humans and their animals in Kajiado and Kiambu Counties of Kenya. We also examined the linkage between the sero-status of humans and that of their livestock.

Introduction

Brucellosis is one of the world's most widespread zoonosis. It is caused by gram-negative bacilli of the genus Brucella.It is a risk to those occupationally exposed to animals such as farmers, veterinarians, laboratorians and butchers and to the public through the consumption of contaminated unprocessed milk, milk products and meats.The epidemiology of Brucella infections involves complex mechanisms which vary according to the disease determinants. Previous studies in Kenya have reported a prevalence range of between 5% - 45% in livestock as well as over 20% in humans in selected regions[1]. Therefore, risk factors observed in a particular agro-ecological region cannot easily be extrapolated to another area with different ecological settings and husbandry practices. A strategy for brucellosis control would greatly benefit from detailed knowledge of local epidemiology. The available data on brucellosis is not adequate enough to inform an effective control process. Decision makers frequently apply different strategies according to the prevalence and epidemiology of the disease. People who interact with livestock on a regular basis are thought to be at an increased risk of contracting zoonoses including Brucellosis.

Previous studies on Brucellosis have focused either on human or animal disease. The current study simultaneously investigated the linkage in sero-prevalence between humans and their animals within the same household at the same time.

Methods

Cross-sectional surveys were conducted in two selected counties namely Kajiado (perceived high risk) and Kiambu (perceived low risk) county respectively. Randomly generated geographical coordinates were used within sub-locations. Households nearest to the GPS point were chosen. For each household, serum specimens were collected from a maximum of 3 humans and 15 animals of each species (cattle, sheep and goats). All sera were tested for brucella antibodies using enzyme-linked immunosorbent assay.

Results

The household prevalence of brucellosis in humans from Kiambu county was 5.7% (25/433) and 31.8 % (87/274) in Kajiado county. A total of 5.6% (31/551) of the households were sero-positive for brucellosis in both humans and animal. In Kiambu County, the prevalence in animals was 1.2% as compared to 2.2% in humans. In Kajiado, the prevalence in animals was 3.4% as compared to 14.1% in humans.

Having animal contact (OR =1.7, 95% CI: 1.0-3.0), as well as handling hides and skins (OR =6.6, 95% CI: 4.5-9.7) predisposed humans to exposure to brucellosis. Risk factors for exposure in livestock included sharing common pasture with wildlife (OR= 6.2, 95% CI: 3.4-11.8), using designated calving areas (OR=2.3, 95% CI: 1.2-4.5) and culling out (OR =2.1, 95%CI: 1.1-3.9). Households with brucella-positive animals were 2.5 times more likely to have a sero-positive person (OR = 2.5, 95%CI: 1.1-5.9). This association was most pronounced in goat-owning households (OR = 5, 95%CI: 2-10). Consuming processed dairy products (OR=0.6; 95%CI: 0.4-0.9) and using commercial milk (OR=0.4; 95%CI: 0.2-0.8) were protective.

Conclusions

This study shows considerable exposure to brucellosis in humans and animals in Kajiado when compared to Kiambu. The prevalence was higher in humans than animals, likely because of chronic exposure in humans associated with interacting with several generations of animals. Households with positive animals were at greater risk of having positive humans. The public health implications of keeping animals need to be made known to livestock keepers and especially pastoralists.

Keywords

Brucellosis; Prevalence; Linked; Risk

Acknowledgments

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References

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