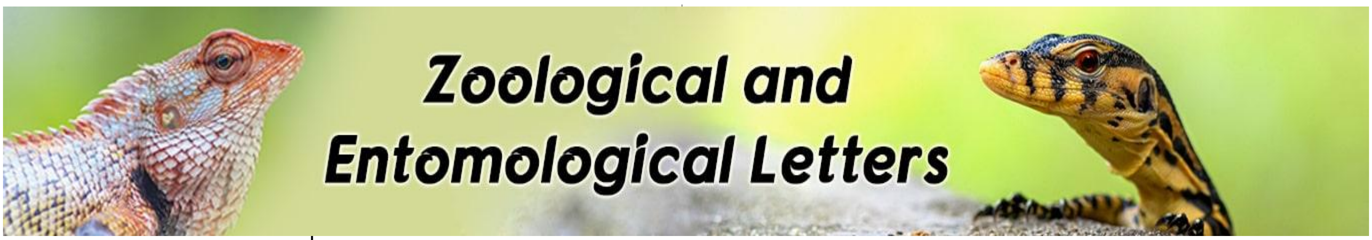

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Seroprevalence and diagnostic evaluation of caprine brucellosis in Baghdad governorate, Iraq

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Abstract
This study employed the Rose Bengal Plate Test (RBPT), 2-Mercaptoethanol Test (2ME), and Competitive-ELISA (C-ELISA) as serological assays to ascertain the seroprevalence of brucellosis in goats from October 2020 to April 2021. The samples were randomly gathered from Baghdad governorate, comprising (700) goats with no matter of history of abortion. Results indicated that the prevalence of brucellosis in goats, as determined by RBPT, was 98 out of 700 (14%). For 2ME, the most common titers ranged from 40 to 160, accounting for the positive RBPT was 22(22.4%), and the C-ELISA results aligned with seropositive RBPT, showing 36 out of 98 (36.7%).

Keywords: Brucellosis, goat, RBPT, 2me, c-Elisa and i-Elisa

Introduction

Brucellosis is a huge public health concern since it is a zoonotic disease that is prevalent practically everywhere, especially in the Middle East and Mediterranean countries [1]. Even though people and animals in many poor nations are trying to manage it, it is still a sickness that is common in certain areas [2]. Brucellosis spreads from one animal to another through eating contaminated food, penetrating the skin, entering through the conjunctiva, breathing it in, and having sex. [3]. People can get brucella from animals by ingesting raw milk and milk products, raw liver, or being near sick animals. This makes it challenging to learn about the infections because most forms of Brucella can infect animals that aren't their regular hosts when they come into touch with them. In Argentina, people who handled infected breeding dogs got Brucella canis, which is an example of this [4]. The disease is marked by both acute and chronic infections in animals, resulting in abortion and infertility [5]. Brucellosis in people causes fever and other symptoms that affect the whole body. It can also cause infections that last a long time and make critical organs including the brain, kidneys, liver, ovaries, and gallbladder very weak [6].There are many serological tests such as Rose Bengal plate test (RBPT) [7, 8], 2-mercaptoethanol (2ME) [9], competitive-enzyme linked immunosorbent assay (C-ELISA) [10], indirect-enzyme linked immunosorbent assay immunoglobulin class M and immunoglobulin class G (I-ELISA) IgM and IgG) [11, 12] to diagnosis brucellosis in sheep, goats, cattle and humans. This study gives an estimation to the morbidity rate and the titer of antibodies in goats by serological test (Rose Bengal plate and 2-mercaptoethanol test), and C-ELISA. We conclude the importance of brucellosis in goats as a major source of the disease in human and the important vaccination programs which must be applied.

Materials and Methods

This study was conducted in compliance with the institutional rules of the University of Baghdad's College of Veterinary Medicine's Animal Care and Use Committee, Iraq. Project Number. The herd's owners gave their verbal agreement before samples were taken. Blood samples were randomly obtained from seven hundred (700) non-vaccinated goats randomly from different region of Baghdad abortion with no matter if areas or flockshave history of abortion or not, representing various ages, as well as from a veterinary hospital in Baghdad Governorate over the period from October 2020 to April 2021. Blood samples were withdrawn by using ten (10) ml volume from jugular veinin the neck region of goat by a sterile disposable syringe under disinfection with 70% ethanol and it was transport to the laboratory and it wasseparated by centrifuged the serum at 3000 r.p.m. /15 minute [13]. Each serum sample withdrawn by micropipette put it into two clean appendrof after testing this serum with RBPT in the same day of centrifuged. The first appendrof was used in serological test 2ME while the second append of was used with C-ELISA. While it was used with I-ELISA of human.RBP Testwas used as described by [14], 2-ME was used as described by [15]. And the competitive enzyme linked immunosorbent assay (C-ELISA), was done and results were interpreted according to the instructions of the manufacture SVANOVIR® in addition I-ELISA (IgM and IgG). The results were statistically analyzed for by using Chi-square tests (χ 2) comparison between percentages which are affecting on brucellosis. Significance was determined at 5% level where applicable. To analyze data using SPSS program [16].

Results and Discussion

Table 1: Distribution of Goat brucellosis frequency by using RBPT, 2ME and C- ELISA tests

Animals	Number of sera test	2-ME for positive sera with RBPT	2-ME for positive sera with RBPT	Total and percentage of 2ME	C-ELISA for positive sera with RBPT
Goat	700	98(14%)	20=3, 40=5, 80=6, 160=4, 320=2, 640=1, 1280=1	22 (22. 4%)	36 (36.7%)

A total of 700 goat sera tests, the positive with RBPT were98 (14%) of administrative regions in Baghdad governorate with non-significant differences (*p*>0.05). The results of the current study are in agreement with [17] who reported a slightly higher prevalence in goat in a percentage 13.3% in Sudan and [18] who reported a slightly higher prevalence in goat in a percentage 12.3% inNigeria respectively. The results of the present study are in disagreement with other scientific studies by [19] in Baghdad; [20] in Ninevah province; [21] in Bangladesh; [22] in Jordan and [23] in Abu Dhabi Emirate who recorded in a percentage of 9.9%; 8.8%; 3.24%; 21.4% and 9.5% respectively. This study documented the prevalence of goat brucellosis by employing 2ME for positive sera in conjunction with RBPT. The findings of the current study align with those of [20] and [24], indicating that the predominant titers range from 40 to 160, potentially reflecting the early or late stages of infection linked with IgG and IgM [19]. The presence of low antibody titers [20] in goats may come from a decrease in antibodies following recovery from the disease, with agglutination occurring due to residual immunoglobulins, particularly IgG, which can persist for several months or up to one-year post-infection [20]. In goats, the findings of the present study contradict those of [21], which reported 5 (0.5%) and [23], which reported 83.3% and 51.7% in vaccinated and unvaccinated animals, respectively, decreasing to 11.1% in aborted animals. The prevalence of goat brucellosis by using C-ELISA for positive sera with RBPT of the current study are in disagreement with [18] in Nigeria; [21] in Bangladesh and [23] in Abu Dhabi Emirate who recorded in a percentage of 12.03%; 2.17% and 8.4% respectively. The differences in these results may be belong to number of sera sample, number of animal which taken in this study, temperature andhumidity of laboratory; Immunological state of animals and type of antigen used in this tests. breed, geographic location, type of diagnostic test, husbandry and environmental factors [24, 25]. We conclude that brucellosis still have a high percentage among goats that considered to be a major risk of spreading the disease in human and animals and also the percentage was high in Baghdad in compare with neighbor countries. Rose- Bengal test is excellent for screening and a very rapid, diagnostictest but sometimes give false- positive and false-negative results; so, it is need to be confirmed by other confirmatory tests (especially ELISA) for goat.

Conclusion

This study demonstrated that brucellosis remains a major health threat to goats in Baghdad Governorate, with an overall seroprevalence rate detected by the RBPT test of 14%. Confirmatory tests showed varying sensitivity, with the 2ME test detecting 22.4% of RBPT-positive samples, while the C-ELISA test detected 36.7%. These results highlight the need for continued surveillance, regular inspection of goat herds, and the development of effective control and prevention strategies to limit the continued transmission of brucellosis between animals and humans.

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Conflict of Interest

The author declares, there is no conflict of interest.

References

1. Mitka S, Anetakis C, Souliou E, Diza E, Kansouzidou A. Evolution of different PCR assay for early detection of acute and relapsing *Brucella* in human in comparison with conventional methods. J Clin Microbiol. 2007;10:1128.
2. Hassanain NA, Ahmed WM. Sero-prevalence of *Brucella* in Egypt with emphasis on potential risk factors. World J Med Sci. 2012;7(2):81-86.
3. Radostits OM, Gay CC, Hinchcliff KW, Constable PD. Veterinary Medicine. 10th ed. London: Elsevier Saunders; 2007. p. 389-390.
4. Lucero NE, Corazza R, Almuzara MN, Reynes E, Escobar GI, Boeri E, *et al*. Human *Brucella canis* outbreak linked to infection in dogs. Epidemiol Infect. 2010;138 :280-285.
5. Paulsen IT, Seshadri R, Nelson KE, *et al*. The *Brucella suis* genome reveals fundamental similarities between animal and plant pathogens and symbionts. Proc Natl Acad Sci USA. 2002;99 :13148-13153.
6. Groussaud P, Shankster SJ, Koylass MS, Whatmore AM, *et al*. Molecular typing divides marine mammal strains of *Brucella* into at least three groups with

distinct host preferences. J Med Microbiol. 2007;56 :1512-1518.
7. Cho D, Nam H, Kim J, Heo E, Cho Y. Quantitative rose Bengal test for diagnosis of bovine *Brucella*. J Immunoassay Immunochem. 2010; 31:120-130.
8. Ferede Y, Mengesha D, Mekonen G, Hmelekot M. Study on the seroprevalence of small ruminant *Brucella* in and around Bahir Dar, northwest Ethiopia. Ethiop Vet J. 2011;15(2):35-44.
9. Akbarmehr J, Ghiyamirad M. Serological survey of *Brucella* in livestock animals in Sarab city (East Azarbayjan province), Iran. Afr J Microbiol Res. 2011;5(10):1220-1223.
10. Portanti O, Tittarelli M, Di FT, Luciani M, Mercante MT, Conte A, *et al*. Development and validation of a competitive ELISA kit for the serological diagnosis of ovine, caprine and bovine *Brucella*. J Vet Med B Infect Dis Vet Public Health. 2006;53(10):494-498.
11. Jama'ayah MZ, Heu JY, Norazah A. Seroprevalence of *Brucella* among suspected cases in Malaysia. Malays J Pathol. 2011;33(1):31-34.
12. Pabuccuoglu O, Ecemis T, El S, Coskun A, Akcali S, Sanlidag T, *et al*. Evaluation of serological tests for diagnosis of *Brucella*. Jpn J Infect Dis. 2011; 64:272-276.
13. Alton GG, Jones LM, Pietz DE. Laboratory techniques in brucellosis. 2nd ed. Geneva: WHO Monograph Series No. 454; 1975.
14. Office International des Epizooties (OIE). Caprine and ovine brucellosis (excluding *Brucella ovis*). In: OIE Terrestrial Manual. Paris: World Organisation for Animal Health; 2009. Chapter 2.7.2.
15. Alton GG, Jones LM, Angus RD, Verger JM. Techniques for the brucellosis laboratory. Paris: INRA; 1988.
16. Snedecor GW, Cochran GW. Statistical methods. 7th ed. Ames (IA): Iowa State University Press; 1980.
17. Nagi SDG. *Brucellosis* in Yemen and Sudan: seroprevalence, causative agent and evaluation of different methods of diagnosis [PhD thesis]. Khartoum: University of Khartoum, Faculty of Veterinary Medicine; 2009.
18. Junaidu AU, Daneji AI, Salihu MD, Magaji AA, Tambuwal FM, Abubakar MB, *et al*. Sero-prevalence of *Brucella* in goats in Sokoto, Nigeria. Res J Biol Sci. 2010;2(4):275-277.
19. Saleem AN, Rhaymah MS, Shamoon GN. Isolation and seroprevalence of ovine *Brucella*. Iraqi J Vet Sci. 2004;18(1):31-38.
20. Al-Hangawe OKS. Comparative diagnostic study of *Brucella* in sheep and goats in Ninevah province using ELISA and other serological tests [MSc thesis]. Mosul: College of Veterinary Medicine, University of Mosul; 2006.
21. Rahman MS, Mithu S, Islam MT, Uddin MJ, Sarker RR, Sarker MAS, *et al*. Prevalence of *Brucella* in Black Bengal goats in Bangladesh. Bangl J Vet Med. 2012;10(1-2):51-56.
22. Hawari A. Epidemiological studies, seroprevalence and some risk factors of *Brucella* in sheep and goats in the south province (West Bank), Jordan. Asian J Anim Vet Adv. 2012; 7:535-539.
23. Mohammed AM, Shigidy MT, Al-Juboori AY. Sero-prevalence and epidemiology of *Brucella* in camels, sheep and goats in Abu Dhabi Emirate. Int J Anim Vet Adv. 2013;5(2):82-86.
24. Arslan SH, Hassan MM, Mohammed NA, Al-Hussary NA, Al-Obaidi QT. Changes in some biochemical parameters accompanied with *Brucella* infection in sheep. Iraqi J Vet Sci. 2011;25(1):107-110.
25. Al-Izzi SA, Barhoom SS. Prevalence of *Brucella* among sheep and goats in Baghdad, Iraq. Iraqi J Vet Sci. 1988;1(1-2):108-115.