

Challenges in Diagnosing Canine Brucellosis

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In the Literature

Mol JPS, Guedes ACB, Eckstein C, et al. Diagnosis of canine brucellosis: comparison of various serologic tests and PCR. *J Vet Diagn Invest.* 2020;32(1):77-86.

FROM THE PAGE ...

Brucella canis, a challenging bacterial pathogen, can cause significant reproductive disease and sporadic disease (eg, diskospondylitis) of other body sites and can be carried long-term and subclinically.¹⁻³ It is also an uncommon but potentially important zoonotic pathogen.⁴⁻⁷

Accurate diagnostic testing is critical for diagnosis of acute disease, for broader disease control purposes, and because diagnosis can have potentially severe outcomes for dogs (eg, euthanasia) and staff (eg, quarantine). However, diagnosis of canine brucellosis can be challenging due to the nature of the pathogen and limitations of available tests.

This study aimed to compare different serologic methods and PCR testing to identify *B canis*. Samples from 254 dogs (4 of which had active clinical brucellosis) from 5 breeding kennels in Brazil were evaluated. Serum and whole blood samples were collected and tested via agar gel immunodiffusion, rose Bengal plate testing, complement fixation testing, microagglutination testing (MAT), 2-mercaptoethanol MAT (2ME-MAT), dot-ELISA testing, and PCR testing. Rapid slide agglutination testing, 2ME-rapid slide agglutination testing, and immunofluorescence assay testing—tests commonly used in North America—were not included.

Overall, there was poor agreement between different serologic tests, with positive results ranging from 6.3% to 16.5%. PCR and 2ME-MAT were the only tests with even reasonable statistical agreement. Using latent class analysis, positive MAT results were most strongly associated with positive PCR results, even though discordant PCR and MAT results were common.

The authors concluded that diagnosing brucellosis remains challenging. Available tests have different inherent limitations in sensitivity and specificity, and sensitivity can be impacted greatly by the type of infection (clinical vs subclinical) and time of sampling with respect to onset of infection. The difficulty in diagnosing canine brucellosis in a population in which the disease is strongly suspected highlights the challenges in screening clinically normal dogs and/or dogs with less overt disease.

... TO YOUR PATIENTS

Key pearls to put into practice:

- 1** *Brucella canis* infection can be difficult to confirm or rule out definitively. Combinations of tests are often required. Sensitivity and specificity of selected tests must be considered when interpreting results.
- 2** Approaches to testing of dogs with reproductive disease, disseminated infection (eg, diskospondylitis), and subclinical infection vary, as tests may perform differently in these patient populations.
- 3** Because of the potentially severe consequences of a positive test result, it is critical clinicians understand the strengths and limitations of individual tests.
- 4** Bacterial culture can provide a definitive diagnosis but is of limited availability due to the enhanced required biosafety practices and often low sensitivity in chronic subclinical infections.

References

1. Buhmann G, Paul F, Herbst W, et al. Canine brucellosis: insights into the epidemiologic situation in Europe. *Front Vet Sci*. 2019;6:151.
2. Gyuranecz M, Szeredi L, Rónai Z, et al. Detection of *Brucella canis*-induced reproductive diseases in a kennel. *J Vet Diagn Invest*. 2011;23(1):143-147.
3. Hollett RB. Canine brucellosis: outbreaks and compliance. *Theriogenology*. 2006;66(3):575-587.
4. Johnson CA, Carter TD, Dunn JR, et al. Investigation and characterization of *Brucella canis* infections in pet-quality dogs and associated human exposures during a 2007-2016 outbreak in Michigan. *J Am Vet Med Assoc*. 2018;253(3):322-336.
5. Lucero NE, Escobar GI, Ayala SM, Jacob N. Diagnosis of human brucellosis caused by *Brucella canis*. *J Med Microbiol*. 2005;54(Pt 5):457-461.
6. Lucero NE, Jacob NO, Ayala SM, Escobar GI, Tuccillo P, Jacques I. Unusual clinical presentation of brucellosis caused by *Brucella canis*. *J Med Microbiol*. 2005;54(Pt 5):505-508.
7. Dentinger CM, Jacob K, Lee LV, et al. Human *Brucella canis* infection and subsequent laboratory exposures associated with a puppy, New York City, 2012. *Zoonoses Public Health*. 2015;62(5):407-414.



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