

SEROPREVALENCE OF CANINE BRUCELLOSIS IN KERALA

Ajithkumar G.¹, Sreejith J.R.², Deepthi L.³, Divya R.N.² and Ambili John²
Obstetrics and Gynaecology Unit, University Veterinary Hospital, Kozhikode, Thrissur

Introduction

Brucellosis is a disease of the reproductive tract which can cause abortion in females, infection of genital organs in males and infertility in both sexes. Canine brucellosis is an infectious disease caused by an intracellular Gram negative bacterium, *Brucella canis*. However, *Brucella* organisms commonly associated with other animal species, such as *B. suis*, *B. melitensis* and *B. abortus* can also infect dogs. The canine brucellosis was first recognized as a cause of abortion and reproductive failures in 1966 and since then it has been documented in several countries. It is common in Central and South America, in the southern states of the United States, Japan and more recently in China. It has been reported sporadically in Europe as well (Wanke, 2004). In Asia, the disease has been reported in India (Srinivasan et al., 1992), Philippines (Baluyut and Duguies, 1997), Korea (Park and Oh, 2001), Japan (Katami et al., 1991), China (Jiang, 1989), Turkey (Diker et al., 1987), Malaysia (Joseph et al., 1983) and Taiwan (Tsai et al., 1983).

The prevalence data of canine brucellosis is meagre, but seroprevalence rates appear as high as 20 to 30 per cent in Mexico and Central/South America. Estimates in the southern United States and Japan have been reported to be 7 to 8 per cent in stray dogs. Most experts are of the opinion that throughout world, about 1 to 6 per cent of the canine population is infected, with the main source of the disease being stray dogs. The possibility of spread of this disease in the light of high rate of transport of dogs across borders of countries and even continents should also be taken into account.

Transmission

Dogs and other canine species are believed to be the only true host of *B. canis*. Natural infection most commonly occur after ingestion of infected

placental materials, aborted fetuses and vaginal discharge from infected bitches that are in heat or recently aborted and during breeding. Following an abortion, organisms may be shed for several weeks or, intermittently, for months. Infected males also may shed organisms in urine, but bacterial numbers are relatively low, except when urine is contaminated with seminal or prostatic fluids. Milk from affected bitches also serves as another contaminant to the environment.

Symptoms

Non-specific signs of brucellosis in both sexes include lethargy, loss of libido, premature ageing and generalized lymph node enlargement. The most dangerous aspect of the disease is its insidiousness, as symptoms are not always exhibited. Clinical signs may be subtle, such as poor hair coat, lack of energy, or exercise intolerance. Arthritis may be present, especially in the back region. Recurrent uveitis has been occasionally reported in infected dogs. The most common sign of brucellosis infection in an apparently healthy bitch is abortion between days 45 and 59 of gestation. Early embryonic death and resorption, 10-20 days after mating, may occur in some cases. These may go unnoticed and the female may be presented subsequently with the chief complaint of "failure of conception". The vaginal discharge associated with abortion, is typically brown or greenish gray in colour.

Infected bitches may deliver both living and dead puppies. Infected bitches may exhibit regular heat cycles and breed normally and in many cases a bitch with brucellosis, after aborting a litter, may conceive and whelp a healthy litter subsequently. The danger in this is that such a bitch can infect any males she is bred to, and her puppies will most likely be carriers of the disease and go on to infect other dogs.

In males, epididymitis of one or both testes

1. Associate Professor 2. Post-graduate Scholar, 3. Doctoral Scholar, Department of Animal Reproduction, Gynaecology & Obstetrics, College of Veterinary and Animal Sciences, Thrissur

and infertility is the major finding. Testicular atrophy and moist scrotal dermatitis are other symptoms.

Treatment

It is very difficult to treat brucellosis successfully. A combination of minocycline and streptomycin (Minocycline @ 10 mg/kg, twice daily orally, combined with streptomycin @ 4.5 mg/kg intramuscular for 7 days) is the most effective treatment. But this regimen of treatment is expensive (Flores Castro and Carmichael, 1981). Tetracycline (tetracycline @ 30 mg/kg orally, twice daily for 28 days) can be substituted for minocycline to reduce cost, but it also lowers effectiveness of treatment. Even if the organism can be successfully eliminated, males frequently remain sterile because of irreversible damages to the testes and epididymis.

All infected animals should be neutered or spayed to reduce chances of transmission and should be considered to be lifelong carriers of the disease, even if treated. All neutered dogs should receive a course of antibiotics such as oral tetracycline (@ 30 mg/kg) twice daily for 28 days and intravenous streptomycin (@ 20 mg/kg) once daily, for 14 consecutive days at the beginning of the treatment (Nicoletti, 1991).

Treatment is not recommended for dogs in breeding kennels and where dogs cannot be isolated and closely monitored after antibiotic therapy. Recrudescence of the infection after cessation of antibiotic treatment is common.

Prevention and Control

◆ There is no vaccine available for the prevention of brucellosis.

◆ Any dog brought into the breeding kennel should be isolated for at least one month and should have two negative brucellosis tests one month apart before being allowed into the kennel.

◆ Stud dogs that are actively used for breeding should be tested at least once in every three months.

◆ Dogs and bitches competing regularly in field trials should be tested once a month and kept segregated from the main kennel area where breeding studs, brood bitches and puppies are kept.

◆ If a dog or bitch in the main kennel area test positive for brucellosis, the entire kennel must be tested.

◆ Brucella infected bitches should not be bred, not even by artificial insemination, due to the risk of contamination from vaginal discharge, milk, and puppies. Repeated blood cultures and serological monitoring for at least three post-treatment months is required, before a dog can be declared negative.

Seroprevalence in Kerala

Nowadays the trend in keeping dog as a pet and a companion is on the rise in Kerala. More over many have identified the potential of dog breeding as a remunerative vocation. Under these circumstances, a preliminary investigation was carried out to estimate the seroprevalence of canine brucellosis among infertile bitches of Thrissur and nearby districts of Kerala.

In order to ascertain the seroprevalence of brucellosis among dogs in our State, a preliminary screening test was carried out at Obstetrics and Gynaecology Unit of University Veterinary Hospital, Kozhikode. From among the infertile bitches presented for treatment, 50 animals with the history of abortion/resorption and/or failure of conception even after repeated breeding were identified, blood samples were collected and sera separated. The Anigen Rapid C. Brucella Ab Test Kit® was used for screening the serum samples. This test was a chromatographic immunoassay for the qualitative detection of Brucella canis antibody in whole blood, plasma, or serum.

The Anigen Rapid C. Brucella Ab Test Kit had a letter of T and C as "Test Line" and "Control Line" on the top surface of the kit. Both the "Test Line" and "Control Line" in result window were not visible before applying any samples. The "Control Line" was used for procedural control and it always appeared when the procedure was performed properly and the test reagents were working. A purple "Test Line" was visible in the result window if there were enough Brucella canis antibody in the specimen. The specially selected Brucella canis antigens were used in test and as both capture and detector materials. These enabled the Anigen Rapid C. Brucella Ab Test Kit to identify Brucella canis

antibodies in specimens, with a high degree of accuracy.

The test was performed as per the instructions provided by the manufacturer. Removed the test kit from the foil pouch and placed it on a flat, dry surface. 20 μ l of serum was added to the sample well with a capillary tube provided along with the kit with a score line for volume of 20 μ l. Added four drops of diluent buffer supplied with the kit slowly in to the well. In cases where the migration of liquid-front fails to appear in the window within a minute, one more drop of buffer was added to the sample well. A purple control band developed in all the cases and waited for 20 minutes to interpret the test results at room temperature. To our surprise, all the bitches tested were negative for *Brucella canis*. From the findings of the screening test, it could be inferred that even though we are much concerned about brucellosis among female dogs, there is not much to worry at this moment. In order to obtain more accurate information on the seroprevalence of brucellosis among the dog population in the State, a massive screening project will have to be undertaken. At the same time the negative result obtained in the present investigation does not permit us to refrain from strict surveillance and control measures.

Summary

Brucellosis is a very serious disease in dogs, not because they are very likely to contract the disease, but because of the consequences of become infected. The disease itself will not kill the dog, but the dog will be genetically dead because he or she cannot be bred, even if the disease does not render the dog sterile. Serum samples of 50 bitches with the history of abortion/ resorption and/ or infertility from different parts of Kerala were screened using *Brucella canis* antibody detection test kit and all of them were found to be negative.

References

- Baluyut C.S. and Duguies M.V. (1997). A serological survey for *Brucella canis* agglutinins in dogs using the macroscopic tube agglutination test. *Philip. J. Vet. Med.* 16: 93-101.
- Diker K.S., Aydin N., Erdeger J. and Ozyurt M. (1987). A serologic survey of dogs for *Brucella canis* and *Brucella abortus* and evaluation of mercaptoethanol microagglutination test. *Ankara Univ. Vet. Fak. Derg.* 34: 268-276.
- Flores Castro R. and Carmichael L.E. (1981). *Brucella canis* infection in dogs: Treatment trials. *Rev. Latinoam. Microbiol.* 23: 75-79.
- Jiang F.X. (1989). A survey on canine brucellosis in Wusu county. *Chin. J. Vet. Sci. Technol.* 1: 18-19.
- Joseph P.G., Mahmud Z.B.H. and Sirimanne, E.S. (1983). Canine brucellosis in Malaysia: a first report. *Kajian Vet.* 15: 17-22.
- Katami M., Sato H., Yoshimura Y., Suzuki T., Suzuki Y., Nakano K. and Saito H. (1991). An epidemiological survey of *Brucella canis* infection of dogs in the Towada area of Aomori prefecture (Japan). *J. Vet. Med. Sci.* 53: 1113-1115.
- Nicoletti P. (1991). Further studies on the use of antibiotics in canine brucellosis. *Compend. Cont. Educ. Pract. Vet.* 13, 944.
- Park C.K. and Oh J.Y. (2001). Bacteriological and serological investigation of *Brucella canis* infection of dogs in Taegu city, Korea. *Kor. J. Vet. Res.* 41: 67-71.
- Srinivasan V.K., Nedunchellian S. and Venkataraman K.S. (1992). Prevalence of canine brucellosis in urban and rural areas of Tamilnadu. *Indian J. Vet. Med.* 12:39.
- Tsai I.S., Lu Y.S., Isayama Y. and Sasahara J. (1983). Serological survey for *Brucella canis* infection in dogs in Taiwan and the isolation and identification of *B. canis*. *Taiwan J. Vet. Med. Anim. Husb.* 42: 91-98.
- Wanke M. M. (2004). Canine brucellosis. *Anim. Reprod. Sci.* 82-83: 195-207.
