Canine Brucellosis in the Jindo

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Introduction

During the mid to late 1960s, Brucella canis was recognized and linked to abortions and reproductive disorders of dogs. It was found later that B. canis has a limited host range. Wild canids and cats are susceptible to infections, while ruminants and swine are resistant to infection. Domestic dogs appear to be the definitive host of the organism.

Most dogs infected with B. canis show no clinical signs. After the organism penetrates a mucous membrane, it may be taken to regional lymph nodes by lymphatic drainage or it may be phagocytized by macrophages, in which it multiplies as an intracellular parasite. By this way the infection with B. canis becomes systemic, but infected dogs are not usually systemically ill. Primary signs are abortion without premonitory signs during the last trimester of pregnancy, typically at 45-59 days of gestation, stillbirths, and conception failures in female dogs. Male dogs may have scrotal dermatitis, testicular atrophy, epididymitis, and/or prostatitis.

The transmission of B. canis occurs most commonly by ingestion or inhalation of contaminated materials, although congenital and venereal infections have been verified. Infected bitches shed the organism in postgestational vaginal secretions, in milk, or in vaginal secretions during estrus. Infected males shed large numbers of organisms in the seminal fluid, rendering venereal transmissions from males to females possible. The infection can be transmitted in the same manner to both species.
females possible. Infected animals commonly have prolonged bacteremia, becoming potential carriers for life. Thus, canine brucellosis caused by *B. canis* has been recognized as an important economic problem in dog breeding kennels.

The Jindo, Korean native dog, is well-known for its hunting and guarding capabilities. Unlike several other dog breeds, however, the Jindo was not developed for those purposes. The dog has been living with Korean people from the time unknown\(^4\). They have been bred in a large closed colony, known as the Jindo County for many years. More attention has been given to the dog only during the last decade\(^5\).

Canine brucellosis appears to be rare in Korea. In 1972, *B. suis* was isolated from an aborted fetus of a four-year-old German Shepherd, and the authors postulated that the infection of the dog was caused by the contact with an infected pig\(^6\). Recently, Moon *et al*\(^16\) found that one out of 50 Jindoes and eight out of 100 mongrels were positive for *B. canis* by rapid slide agglutination test. Later, they reported the occurrence of canine brucellosis in a large kennel in Chonnam area\(^7\) and the results of antibiotics therapy in the dogs infected with *B. canis*\(^8\).

In the present study, the prevalence of abortion in the Jindo was surveyed by questionnaire. Then, the prevalence of antibodies to *B. canis* in the Jindo was ascertained by serology. Microbiological and pathological examinations were performed on three female Jindoes which experienced abortion, and two female Jindoes naturally-infected with *B. canis* were treated with antibiotics.

### Materials and Methods

#### Field survey

A questionnaire was prepared and sent to Jindo owners in the five myons (Jindo, Gunnae, Euishin, Chodo, and Imhoe) of the Jindo County. The following information over the period of one year (from July 1997 to June 1998) was sought\(^9\):

1. The address of the owner.
2. The type of raising the Jindo.
3. If abortions occurred, the age of bitch (es) that aborted.
4. How many successive abortions were observed in individual bitches?
5. The season when the abortion occurred.
6. The size of the aborted fetuses.
7. The general condition of the bitches at the time of abortion.

Replies to this questionnaire were received from 249 Jindo owners. The bitches were one to six years old and had at least one pregnancy.

#### Serology

Blood samples were collected from the cephalic vein of 396 Jindoes (333 bitches and 63 dogs) in five myons, where the questionnaires were sent to the Jindo owners. The sampling was done over the period from May to October, 1998. The blood was allowed to clot at the ambient temperature. Nonhemolyzed serum was separated and frozen at -20°C until use. Serum samples were tested by Canine Brucellosis Antibody Test Kit (D-Tec CB, Synbiotics Corporation, San Diego, California), which is employing both rapid slide agglutination test (RSA T) and 2-mercaptoethanol-rapid slide agglutination test (2-ME-RSAT)\(^4\), as described in the instructions for the test kit. The results were recorded within 2 minutes after the card was gently rocked for 10-15 seconds and placed on a flat surface. Sera giving strong agglutination within 30 seconds were recorded as 3+, those giving agglutination within one minute as 2+, and those giving weak agglutination within 2 minutes as 1+. Only if a serum tests positive by these two test procedures should the animal be presumptively diagnosed as having *B. canis* infection.

#### Bacteriologic and pathologic procedures

Three female Jindoes which have histories of abortion and which were seropositive to *B. canis* were purchased from the Jindo County. The three bitches 2-3 years old were euthanized with phenobarbital sodium and necropsied. The uteri were examined grossly. For bacterial isolation, their uterine tissues were obtained. Trimmed tissues were incised several times, placed into an 11×15 cm sterile bag with an approximately equal volume of sterile saline solution, and macerated in a blender. They were inoculated into