Seroprevalence of *Coxiella burnetii* Infections among Cats in Different Living Environments

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**ABSTRACT.** The seroprevalence of *Coxiella burnetii* infection among pet cats in Japan and Korea and stray cats in Japan was investigated by an indirect fluorescent antibody technique and PCR test. Forty-four (14.2%) of 310 pet cats in Japan were seropositive, as were 15 (41.7%) of 36 stray cats in Japan and 10 (8.6%) of 116 pet cats in Korea. The antibody positive rate in stray cats was significantly higher than that in pet cats, but there was no correlation between the rates in Japanese and Korean pet cats. In this study, the prevalence of *C. burnetii* infection among cats in different living environments was found and it is difficult to deny that stray cats would be one of the important sources of infection for human Q fever.

**KEY WORDS:** Coxiella burnetii, epidemiology, feline.

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Q fever is a worldwide zoonosis caused by *Coxiella burnetii*, an obligate intracellular bacterium living in the phagolysosomes of the host cells [9]. *C. burnetii* is transmitted to humans most often by inhalation of an aerosol containing infected material that has been contaminated with parturient products of infected animals [3, 7, 9].

In Japan, serological evidence of *C. burnetii* infection in domestic and companion animals, wild animals and humans has been reported [3, 5, 6, 10, 11]. These data suggested that domestic animals such as cattle and sheep have been considered to be the source of human infection. Pets such as dogs and cats have also recently received attention as sources of infection in humans. In the United States, cases of Q fever have been reported [3, 7, 9]. It has been reported that most animals infected with *C. burnetii* are asymptomatic [9], appear healthy and excrete the microorganism, which serves as a significant source of infection in humans. In the United States, cases of Q fever...
in which the source of infection was assumed to be cats have been reported [12], and the possibility of pets as a source of infection has been noted. In Japan, the opportunities for contact with pet dogs and cats have been increasing along with the popularity of these animals. Many epidemiological investigations have been performed and the infection status of pet animals has been clarified [3, 6, 10, 11]. Moreover, high antibody positivity among veterinarians suggests a relationship to contact with pets [1].

These findings suggest the infection *C. burnetii* is widely prevalent in pets, which may serve as a source of infection in the general population.

On PCR, *C. burnetii* was detected in only 1.3% of pet cats in Japan. Since the PCR-positive animals were antibody-negative, they are considered to have been infected shortly before sampling of the sera, and only pet cats in Japan were suggested to be able to transmit *C. burnetii* to humans at the time of serum sampling.

In cats living in different environments, the antibody positivity among stray cats was 41.7%, which was significantly higher than that (14.2%) in pet cats (P<0.001). These findings show that differences in the prevalence of *C. burnetii* infection depends upon living environments.

Pets have been suggested as a possible route of *C. burnetii* infection in humans, and attention is often paid to the animals kept by the patients, but only whether the patients are keeping pets or not appears to be asked in patient inquiries. However, as humans who do not keep pets are also infected with *C. burnetii*, a history of contact with cats other than those kept by patients is also a possible source of infection.

In foreign countries [2, 13], *C. burnetii* has often been transmitted from domestic livestock, and reports of cases or investigations of *C. burnetii* infection from pets are scarce [8, 12]. On the other hand, as no significant difference was observed in the prevalence of *C. burnetii* infection in pet cats between Korea and Japan, cats may be able to mediate *C. burnetii* infection also in Korea, and transmission of *C. burnetii* from pets to humans is not considered to be characteristic of Japan, where *C. burnetii* infection appears to occur frequently without contact with domestic livestock.

This study clarified that strays cats are more likely to be infected with *C. burnetii* than pet cats, and are considered more important as a route of infection in humans. The relationship between different environments in cats and *C. burnetii* infection patterns remains to be clarified, which may lead to elucidation of the source and route of *C. burnetii* infection in humans.

### REFERENCES