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COXIELLOSIS/Q FEVER IN CATS
ABCD guidelines on prevention and management

Herman Egberink, Diane Addie, Sándor Belák, Corine Boucraut-Baralon, Tadeusz Frymus, Tim Gruffydd-Jones, Katrin Hartmann, Margaret J Hosie, Albert Lloret, Hans Lutz, Fulvio Marsilio, Karin Möstl, Maria Grazia Pennisi, Alan D Radford, Etienne Thiry, Uwe Truyen and Marian C Horzinek

Bacterial properties

Q fever is a zoonotic disease caused by Coxiella burnetii. This is a Gram-negative, obligate intracellular, small, pleomorphic bacterium belonging to the order Legionellales. The organism has a complicated life cycle with different morphological stadia. It may occur as a small-cell variant and a large-cell variant. The small-cell variants are the resistant spore-like forms that can survive for long periods in the environment, being resistant to several chemical and physical noxae.1

Epidemiology and pathogenesis

Many species of mammals, birds and ticks can be infected with C burnetii. However, the most common reservoirs are cattle, sheep and goats. Since the bacterium has a tropism for the uterus and mammary gland, the placenta and fetal membranes may be heavily contaminated. Contaminated aerosols from fetal membranes, urine, faeces or milk of infected animals are considered the main reservoir of infection for humans. Especially during parturition, high numbers of the bacteria are excreted, thereby contaminating the environment.

Cats can also become infected and have been implicated as a source of infection for humans.2–6 Cats most commonly become infected via tick bites, ingestion of contaminated carcasses or after aerosol exposure. Exposure of cats is relatively common, as can be concluded from several serological studies.7–10 In these studies, results for seropositivity in cats ranged from 2–19%. In one study, a significantly
higher antibody positive rate was demonstrated in stray cats (41.7%) as compared with pet cats (14.2%). In a study on the prevalence of $C.\ burnetii$ DNA in vaginal and uterine samples from healthy shelter or client-owned cats, 4/47 uterine biopsies were shown to be positive by polymerase chain reaction. Like in farm animals, $C.\ burnetii$ colonises the placenta of infected cats during pregnancy in high numbers. $C.\ burnetii$ could be cultured from the uterus of cats for 10 weeks after parturition. After experimental infection, $C.\ burnetii$ was cultured for 2 months from the urine of infected cats.

Studies have been published indicating an association between Q fever pneumonia in humans after exposure to placenta and amniotic fluid of aborting or apparently healthy cats. In a case-control study from Maritime Canada, several risk factors for developing Q fever in human patients were identified. The strongest association was documented for exposure to stillborn kittens and parturient cats.

In a seroepidemiological study among US veterinarians, contact with cats was not shown to be associated with $C.\ burnetii$ seropositivity. In this study, risk factors associated with seropositivity included age >46 years, routine contact with ponds, and treatment of cattle, swine and wildlife. In another study, no relationship was found between cat and dog ownership and an increased incidence of seropositivity for $C.\ burnetii$.

In conclusion, periparturient cats should be considered a potential source of infection. However, farm animals are by far the most important source of infection for humans.

**Clinical signs**

In animals the disease is usually subclinical, but abortion might occur. In experimentally infected cats, fever, anorexia and lethargy have been noted. Clinical signs started 2 days after inoculation and lasted for 3 days.

**Diagnosis**

Serological testing and isolation of the organism might be used, as for humans (see box above); however, in cats diagnosis is not routinely performed.

**Treatment**

If a diagnosis has been established in a cat with clinical signs, tetracyclines and chloramphenicol can be used for treatment [EBM grade IV].

**Prevention**

Cats potentially exposed to $C.\ burnetii$ by contact with infected farm animals or recent tick infections may excrete bacteria during parturition. To minimise the risk of infection, gloves and a mask should be worn when attending parturient or aborting cats. Predation and ectoparasite exposure put the cat at risk of infection and tick prevention is recommended (see ESCCAP guideline on control of ectoparasites in dogs and cats) [EBM grade IV]. Vaccines are not available for cats.

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**Conflict of interest**

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