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***Capnocytophaga Canimorsus* Infection in Cats: ABCD guidelines on prevention and management**

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CAPNOCYTOPHAGA CANIMORSUS INFECTION IN CATS

ABCD guidelines on prevention and management



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

Overview: *Capnocytophaga canimorsus* and *Capnocytophaga cynodegmi* are part of the normal bacterial flora of the oral cavity of dogs and cats. *C canimorsus* is more pathogenic and causes more severe infections in humans.

Infection: Disease is less frequently seen after a cat bite, scratch or close contact than after dog contacts. Serious disease has been reported in people, especially associated with immunocompromise and alcoholism. Disease in cats is not well documented; two cases of respiratory infection have been associated with the presence of these bacteria.

Diagnosis: Diagnosis is based on culture in specific media, but these are slow growing bacteria; polymerase chain reaction and sequencing may aid in diagnosis and species identification.

Treatment: Penicillin or beta-lactams are the treatment options of choice.

Zoonotic potential: Based on incidence surveys, the zoonotic potential is low. The risk may be higher for immunocompromised persons, where dog and cat ownership must be discussed.

Bacterial properties

Capnocytophaga canimorsus is a fastidious, slow-growing, capnophilic, facultative anaerobic, Gram-negative, rod-shaped bacterium displaying gliding motility that belongs to the normal flora of the oral cavity of dogs and cats.^{1,2} Another species, *Capnocytophaga cynodegmi*, is also present in the normal flora.³ Both can cause wound infections in humans after a bite, *C canimorsus* being associated with more severe infections.³

Epidemiology and pathogenesis

C canimorsus was first cultured in 1976 from the blood and spinal fluid of a dog-bite patient, hence its name (canis = dog, morsus = bite). Infections occur worldwide. Many dogs and cats carry *C canimorsus* in their oral cavity.

In one study, *C canimorsus* was cultured from 26% of dogs and 15% of cats sampled. Using a species-specific polymerase chain reaction (PCR) that distinguishes

between *C canimorsus* and *C cynodegmi*, much higher prevalences were found in Japan; the former species was detected in 74% of the dog and 57% of the cat samples.⁴ In the Netherlands, a recent survey documented *C canimorsus* in 21% of the cats.⁵

Human infections with *C canimorsus* are associated with dog and cat bites (54%), scratches (8.5%) or close animal contact (27%).⁶ One case of keratitis reportedly followed a corneal injury caused by a fractured cat's tooth during extraction.⁷ Cat bites and scratches or contact with cats

European Advisory Board on Cat Diseases

The European Advisory Board on Cat Diseases (ABCD) is a body of experts in immunology, vaccinology and clinical feline medicine that issues guidelines on prevention and management of feline infectious diseases in Europe, for the benefit of the health and welfare of cats. The guidelines are based on current scientific knowledge of the diseases and available vaccines concerned.

The latest version of the *Capnocytophaga canimorsus* infection in cats guidelines is available at www.abcd-vets.org



Disease in humans

Only about 200 cases of human infection have been reported since 1976.⁸ Most cases occur in immunocompromised people after a dog bite. The range of clinical features varies from an infected local wound to sepsis, meningitis, nephritis, osteomyelitis, endocarditis, peritonitis, pneumonia, purulent arthritis and disseminated intravascular coagulation.^{6,8,11} The severe course of infection is mainly found in chronic alcohol abusers, asplenic and immunocompromised persons,^{6,12} but has been reported in healthy individuals.¹³ The mortality rate is around 30%.¹⁰ While most cases have been related to contact with dogs, infection after cat bites or scratches has also been described.^{14–16}

Zoonosis

C canimorsus is a causative agent of local wound infections, through to severe systemic disease.

**Zoonotic potential**

The risk of disease after a cat bite in immunocompetent people is low, if minimal prophylactic measures are taken. Immunocompromised cat owners, however, are at risk of developing a serious infection and should be informed. Rough playing with cats, with the inevitable bites and scratches, should be discouraged.

have been reported in fewer than 10% of cases.⁶ In general, cat bites cause less tissue damage than dog bites, which might create less favourable conditions for bacterial growth.⁸

Capnocytophaga species infection is quite uncommon after dog and cat bites. In surveys from Denmark and the Netherlands, a yearly incidence of sepsis due to *C canimorsus* was calculated to be 0.5 and 0.63 per million population, respectively.^{9,10}

Clinical presentation

Capnocytophaga species infections after bite traumas have not been reported in cats, and only two cases of a possible pathogenic role of the bacterium have been documented. In one instance, *Capnocytophaga* species was isolated from a case of chronic sinusitis and rhinitis, and – based on DNA sequencing – a strain closely related to *C canimorsus* and *C cynodegmi* was identified from nasal discharge. Since no other causes for chronic nasal discharge were found, the role of *Capnocytophaga* species was considered likely.¹⁷ Another case report describes the isolation of *C cynodegmi* from bronchoalveolar lavage samples from a cat with lower respiratory tract infection and pulmonary carcinoma. Clinical signs and bacterial colonisation resolved after treatment with enrofloxacin.¹⁸

Diagnosis

In humans, diagnosis of a *C canimorsus* infection is usually based on bacterial culture of blood or other body fluids; isolation from bite wounds is rare. The bacterium grows slowly on special media (chocolate agar or heart infusion agar with 5% rabbit blood, incubated in a 5% CO₂ atmosphere).⁶ PCR methods can distinguish between *C canimorsus* and *C cynodegmi*.⁴

EBM grades

The ranking system for grading the level of evidence of a statement within this article is described on page 533 of this Special Issue.

Cat bites and scratches or contact with cats have been reported in fewer than 10% of cases of human infection.

**Treatment and prevention**

In humans, the first choice antibiotic is penicillin G or potentiated penicillins as amoxicillin–clavulanate acid. Immediate cleaning and disinfection of bite wounds and scratches is important, as is antibiotic prophylaxis [EBM grade III].^{8,11}

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Conflict of interest

The authors do not have any potential conflicts of interest to declare.

KEY POINTS

- ❖ *Capnocytophaga* species are present in the normal oral flora of dogs and cats.
- ❖ Disease in humans is more often associated with dog bites or contact than with those of cats.
- ❖ While disease in humans is rare, mortality can be high in immunocompromised individuals if septicæmia occurs.
- ❖ Immunocompromised cat owners need to be alerted to the risk of bite or scratch wounds and the consequent bacterial infections.



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