Feline infectious anaemia (FIA) is the term used to describe the disease caused by a bacterial parasite called *Haemobartonella felis* which lives on the surface of red blood cells. The resulting structural damage can cause anaemia if the red blood cells are destroyed. The cat's own immune system may also cause death of red blood cells as it tries to kill the parasite attached to them. Clinical signs usually reflect the underlying anaemia. Cats which have been infected with FIA may remain carriers of the parasite for life.

New names and new species for *Haemobartonella*

Recently it has been discovered that there are actually two distinct species of haemobartonella organisms that infect cats. These species are collectively known as the feline haemoplasmas and the new names given to the two species are *Mycoplasma haemofelis* and *Candidatus Mycoplasma haemominutum*. It is important to be aware of the differences between these species as they have different effects in cats. *M haemofelis* (sometimes called the large strain) often results in anaemia in cats while *Candidatus M haemominutum* (sometimes called the small strain) often causes no clinical signs at all.

Who is at risk?

*M haemofelis* seems to be relatively uncommon in cats in the UK (1.4 per cent of cats in a recent study) while infection with *Candidatus M haemominutum* is seen in around 17 per cent of cats. Older male non-pedigree cats are most likely to be infected, and fighting is believed to be one of the ways that the parasite may be transmitted between cats. Cats infected with fleas may also be at an increased risk because fleas may transmit infection between cats.

*M haemofelis* can cause anaemia in normal healthy cats. *Candidatus M haemominutum* may be more of an opportunistic pathogen, causing disease in cats which are stressed or ill due to other diseases, since it has been found that cats infected with feline leukaemia virus (FeLV) or feline immunodeficiency virus (FIV) can develop anaemia due to *Candidatus M haemominutum* infection.

Signs and symptoms

FIA, particularly due to *M. haemofelis*, causes anaemia which may be accompanied by fever in the early stages of infection. Clinical signs of anaemia include tiredness, depression, a reduced appetite, and pale gums. Weight loss can occur. Some cats also show respiratory signs. Such clinical signs can be seen with a variety of diseases that result in anaemia, and are not specific for FIA. Other clinical signs may include enlargement of the spleen and lymph nodes.
Diagnosis
Diagnosis of FIA is problematic. It usually relies upon the identification of the organism on the surface of red blood cells on specially stained blood smears. However the parasite may not always be visible on blood smears from infected cats, because it appears in the blood in waves or cycles rather than being continuously present. In addition there are many artifacts that can be misdiagnosed as organisms on blood smears. Polymerase chain reaction (PCR) assays are now available in the UK for diagnosis of FIA. PCR is a very sensitive technique which enables detection of very small amounts of DNA belonging to particularly organisms such as the feline haemoplasmas. PCR also enables differentiation between the two species of feline haemoplasma which exist, so that it can be determined whether a cat is infected with one, or other, or both feline haemoplasma species. PCR is performed using a small blood sample.

The anaemia induced by feline haemoplasmas is usually regenerative in type. This means that the cat is able to respond to the anaemia by producing new red blood cells which are visible in the circulation. However some infected cats are not anaemic because they are asymptomatic carrier cats, or because they are infected with Candidatus M haemominutum which does not always cause clinical disease. Since FIA (particularly with Candidatus M haemominutum) can be an opportunistic infection, affected cats should be checked for the presence of underlying illnesses, including FeLV and FIV infection, which may have resulted in an exacerbation of FIA.

Treatment
Antibiotics are used to treat FIA. Doxycycline has been most commonly used and is given for three to four weeks. Enrofloxacin has also been used to treat FIA. Corticosteroids may also be used, in conjunction with antibiotics, to suppress the immune-mediated destruction of red blood cells if this is felt to be important. PCR can be used to monitor efficacy of treatment. In cats with severe anaemia blood transfusions may be required. Supportive care to encourage the cat to eat, and rehydration therapy in dehydrated cases, are also important.

Carriers
It has been shown that although antibiotics can be effective at treating the anaemia, they do not always eliminate infection and cats can remain chronic carriers for a long time. Such carrier cats can appear healthy without clinical signs, but relapses are occasionally reported at times of stress.

Spread of infection
It is still not known how feline haemoplasmas are spread between cats. Very young kittens can be infected, implying that infection is vertically spread from the mother. As mentioned above, fighting and fleas have been implicated in transmission of infection between cats. Saliva and urine are not thought to be able to transmit the disease and non-infected and infected cats have been housed together for long periods with little evidence of transmission between cats. Ingestion (such as with cat bites) and injection of infected blood (such as with a blood transfusion from an infected donor) can both transmit infection.

Prevention
Since the methods of transmission of feline haemoplasmas are not fully understood, it is hard to advise on prevention of infection. In view of the known risk factors which exist for infection it is wise to take measures to prevent flea infestation and reduce inter-cat aggression. Infected cats should not be used as blood donors.

This information sheet is produced by the Feline Advisory Bureau

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