



Feline immunodeficiency virus (FIV)

Feline immunodeficiency virus (FIV) is a significant cause of disease in cats worldwide. It was first discovered during the investigation of a disease outbreak in a previously healthy colony of rescue cats in America that had been showing similar signs to people with acquired immunodeficiency syndrome (AIDS) caused by human immunodeficiency virus (HIV) infection. Although HIV and FIV are very similar, the viruses are species specific, which means that FIV only infects cats and HIV only infects humans. Thus there is no risk of infection for people in contact with FIV-positive cats.

What is FIV and how does it cause disease?

FIV affects the cells of the immune system (white blood cells) killing or damaging them. This causes a gradual decline in the cat's immune function. Early stages of infection may not cause outward signs. The immune system is very important in fighting infections and monitoring the body for cancerous cells and thus FIV-infected cats are at a far greater risk of disease and infection with other viruses, bacteria and other organisms such as *Toxoplasma gondii* or *Haemobartonella felis* (a blood borne parasite which causes anaemia).

Prevalence of FIV

The overall prevalence of FIV in the healthy UK cat population is approximately 6 per cent and estimated to be approximately 14 per cent in the sick cat population. This prevalence varies in different areas of the world and between different cat populations (ie, a house cat compared to a farm or feral cat).

Which cats are at risk?

The most common method of transmission of FIV is via biting during fighting. For this reason entire male cats carry a higher risk of infection and a free-living lifestyle, of feral or stray cats, increases the prevalence. Any cat can be infected at any age but there is often considerable delay between infection and development of clinical signs and thus the appearance of the disease is more common in middle-aged to elderly cats.

How is FIV spread?

Biting is considered to be the most important method of transmission of FIV. The saliva of an infected cat contains large amounts of virus and a single bite can result in transmission of infection. Infection can also occur by close social contact within a group of cats where there is no overt aggression via the sharing of food bowls and mutual grooming. A small number of kittens born to FIV-infected queens may also become infected in the womb or by drinking infected milk. This is difficult to confirm until several months after birth because of the presence of maternally derived antibodies (see section entitled 'How is FIV diagnosed?'). Sexual transmission is not thought to be a significant route of infection. It is not known if blood sucking parasites such as fleas can spread infection so it is wise to maintain a regular flea control programme.

What are the clinical signs of an FIV infection?

The disease conditions associated with FIV infection are fairly non-specific. During the primary phase of infection in the first 2-4 months, cats may show short-term signs of illness including malaise, pyrexia (high temperature) and possibly lymph node (the glands that filter blood from the body to check for infection or cancerous cells) enlargement (lymphadenopathy). Most cats will recover from this early phase and enter a second phase when they appear to be healthy. Eventually in the third phase of infection, other signs of disease develop which can be as a direct effect of the virus. One example would be infection of the gastrointestinal tract which may cause diarrhoea. By depressing the immune system and the cat's ability to fight off infection, the FIV infected cat is then prone to other (secondary) infections and diseases. These conditions can take many forms and therefore the clinical signs are quite variable. However the combination of multiple persistent or recurrent disease may point to immunodeficiency. Common signs include malaise, weight loss, inappetence, pyrexia, lymphadenopathy and gingivitis (inflamed gums). Additional problems include rhinitis (inflammation of the tissue lining the nose causing sneezing and nasal discharge), skin infections, anaemia, conjunctivitis (inflammation of the lining of the eyes), uveitis (inflammation of the internal structures of the eye) and diseases of the nervous system which may cause behavioural changes or seizures (fits). Infected queens may abort litters.

How is FIV diagnosed?

There are several test systems available for diagnosing FIV infection. Some of these tests can be performed in your own vet's practice. These tests involve detecting antibodies to the virus. As with most diagnostic tests, this test is not 100 per cent accurate and may produce some false positive or negative results in the following situations:

- Some FIV infected cats produce antibodies which are not detected by the standard test (false negative).
- The sample may be contaminated (false positive).
- In early stages of infection, FIV antibody is not produced (less than two months following infection). It is thus prudent to repeat a negative test result in a suspicious animal eight to 12 weeks later.
- Kittens born to FIV infected queens will receive maternally derived antibodies via the milk and these antibodies are detected when the kitten is tested for FIV. Although all kittens born to an FIV-positive queen will be antibody positive, the virus itself will only be passed on to approximately 30 per cent of the litter. Maternally derived antibody may be present for up to four months. Kittens should thus not be tested for FIV via an antibody test until they are at least six months old

More specialised tests are also available at external laboratories (which your vet can send samples to) to detect the virus itself and these tests are very sensitive. Virus isolation can also be performed. If the initial antibody test is in any doubt or gives a confusing result then your vet may request an additional confirmatory test is performed to ensure that the correct diagnosis is reached.

Treatment options

To date there is no treatment that has been shown to reverse an established FIV infection.

The main aim of treatment for an FIV-infected cat is to stabilise the patient and maintain a good quality of life. Although not licensed for use in cats, some antiviral medications used in patients with HIV infection (such as azidothymidine, AZT), have provided some improvements in a proportion of FIV-infected cats.

Interferon, a compound that interferes with virus replication, has received a lot of attention recently in the treatment of many viral infections. Recombinant Feline Omega Interferon is the first veterinary interferon available on the European market and has antiviral and immunomodulatory (adjusts the immune response) properties. To date there are no completed scientific studies as to the effectiveness of this product but anecdotally there have been some positive reports of its usefulness in treatment of FIV-infected cats.

Evening primrose oil (550 mg once daily) in mildly affected FIV-positive or asymptomatic cats may produce some improvements such as increases in bodyweight and blood cell counts.

Prompt and effective management of secondary infections is essential in the sick FIV-positive cat. As these cats are immunosuppressed, a much longer course of antibiotics is often required.

Long-term management of the FIV-infected cat

Cats infected with FIV should ideally be confined indoors to prevent spread of the virus to other cats in the neighbourhood and to minimise exposure of affected cats to infectious agents carried by other animals. Good nutrition and husbandry are essential to maintain good health in infected cats. These cats should be fed a nutritionally balanced and complete feline diet. Raw meat, eggs and unpasteurised milk should be avoided, because the risk of food-borne bacterial and parasitic infections is greater in immunosuppressed individuals. A programme for routine control of parasites (fleas, ticks, worms) should be instigated and consideration should be given to the type and frequency of vaccination. In FIV infection or in other cases where immunosuppression is suspected or proven, there is a potential risk with the use of live vaccines and potentially a risk that these vaccines may on occasion result in the development of clinical disease. While this is likely to be more of a theoretical than a practical risk, nevertheless, where a choice is available, it may be safer to use a killed/sub-unit vaccine rather than a traditional live vaccine.

Cats infected with FIV should receive wellness visits at least semi-annually to promptly detect changes in their health status. Your vet will perform a thorough examination of your cat and concentrate particularly on the mouth, skin, lymph nodes and eyes and record your cat's weight. A blood sample should also be analysed yearly to check your cat's blood count. If any illness is detected either by the owner or the veterinary surgeon then supportive therapy should be instituted immediately.

Intact male and female cats should be neutered to reduce the stress associated with mating behaviours and seasons. Neutered animals are less likely to roam outside the house or interact aggressively with their housemates.

Prevention and control

A vaccine for FIV has been licensed in the USA but there is limited data on its efficacy. As the vaccine's function is to produce antibodies to the virus, the use of FIV vaccination in the UK would invalidate most in-house testing kits available to your veterinary surgeon.

If one cat in a household is confirmed to be FIV positive then ideally the FIV infected cat should be isolated or rehomed. However, as the risk of transmission by social contact such as sharing food bowls and mutual grooming is very low, many owners elect to keep the household as it is. It may be helpful to feed cats using separate food bowls as large amounts of virus are present in saliva. Litter trays and food bowls should be disinfected after use to kill the virus. Once outside of the cat's body the virus dies within a few minutes, so infection is not easily carried on clothing or other objects.

Advice for breeding colonies

To minimise the risk of introducing FIV into the colony, breeders are advised to prevent their breeding cats having free access outdoors, or having contact with any cats that are allowed outdoors. Annual testing of breeding cats and of new cats before introduction, is advised. If an infected cat is identified then appropriate measures must be taken:- stop breeding, test all other cats and remove or completely separate infected ones. All cats should be retested in 3-6 months, and if still negative then breeding can resume.

Advice for cat rescue centres and organisations

Ideally routine screening should be performed in all cats but financial constraints mean that this is often not possible. In this situation, any symptomatic cats should be tested together with any obviously aggressive cats (often entire male cats). Also any stray or feral cats should be tested.

Ideally cats should be housed separately and, if not, then kept in the smallest groups possible. A policy of neutering before rehoming should also be effective in reducing transmission of FIV.

Prognosis for infected cats

The prognosis for FIV-infected cats remains guarded. If the diagnosis of FIV infection is reached early in the course of the disease, there may be a long period during which the cat is free of clinical signs related to FIV. Although it is not certain that all infected cats go on to develop an immunodeficiency syndrome, the evidence available suggests that the majority do, and in all cats the infection appears to be permanent. Many cats with FIV can remain healthy for extended periods with the above management guidelines.

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