

Feline Infectious Peritonitis

Feline Infectious Peritonitis (FIP) is a progressive, almost always fatal, viral disease of domestic cats. It affects some exotic cats, with the cheetah being particularly susceptible. It does not affect non-feline species, such as dogs.

Cause and Transmission

FIP is caused by a virus in the coronavirus family. The feline infectious peritonitis virus (FIPV) and the feline enteric coronavirus (FECV) are the main corona viruses of cats.

Disease caused by FECV is usually self-limiting and involves diarrhea in young kittens. Infection with the FIPV is serious and usually has fatal consequences.

Transmission of FIPV between cats is most likely by the fecal-oral route; a susceptible cat is infected by coming in contact with fecal material from an infected cat, mainly through shared litter pans. The virus is swallowed and begins to reproduce in the lining of the intestine. Once certain blood cells become infected with the virus, they transport it throughout the body. Also, it is considered possible that the virus can be transmitted between cats through nasal, salivary and urinary secretions.

Contributing Factors

Exposure to the virus does not necessarily equate with infection and progression to death. A strong, healthy immune system is important for recognition of the virus and preventing its reproduction in the cat's body. Some cats are able to completely eliminate the virus, whereas others are infected but show minimal or no signs of infection. These cats may eventually eliminate the virus or continue to harbor a small amount of virus in the body. They may or may not become ill with FIP at a later time. Cats that are unable to eliminate the virus may show signs of serious illness in a matter of a few weeks.

Environmental stresses are important factors in transmission of the disease. Crowding of many cats together leads to stress, suppression of the immune system, and sharing of the virus. This scenario is most common in overcrowded catteries where cats come in close contact with one another. Concurrent infection with immune-suppressing viruses, such as the feline leukemia virus (FeLV) and feline immunodeficiency virus (FIV), also predisposes cats to infection with FIPV.

Prevalence

Male and female cats are affected equally. Approximately half the cats with FIP are younger than 2 years old. Most cats have been multi-cat households within the past year. The disease can incubate for months or even years.

Because FIP is difficult to diagnose, studies, which evaluate its overall prevalence in cats, provide only an estimate. In infected catteries, 80-90% of the cats may test positive for exposure to one of the corona viruses.

Clinical Signs

Cats with FIP may initially only show vague, nonspecific signs, such as poor appetite, fever, and weight loss. Virtually any organ system may be affected, so a variety of signs are possible.

In general, we consider that there are two forms of FIP: the dry (non-effusive) form and the wet (effusive) form. The wet form is characterized by the accumulation of large quantities of fluid in the chest and/or abdomen. If it occurs in the chest, the cat will experience difficulty breathing. When it occurs in the abdomen, a large, bloated appearance will result. The dry form affects the target organs in a similar fashion, but no fluid is produced. At different times during the disease process, the cat may pass from one form to the other. Because the type of fluid that is produced with wet FIP is very unusual, it is easier to diagnose than the dry form, where signs may be more vague.

Diagnosis

Diagnosis of FIP may be difficult and frustrating. There are no specific tests, which are reliable in all cases. Biopsy of an affected organ provides the only definitive diagnosis; this provides the pathologist with a small sample of tissue for study. Recovery of such tissue from an already sick cat involves a certain amount of risk.

The following tests are usually used on cats with suspicious clinical signs.

1. Coronavirus Test. Antibodies are the circulating defense agents of the immune system. This test detects antibodies to *any* coronavirus so this test does not discriminate between exposure to FIPV and FECV. If positive, this test indicates that one or both of those viruses WAS or IS present in the cat. Since antibodies may persist even when the virus is no longer present, a positive test can be misleading in some cases. Also, terminally ill cats may have their antibodies "tied up" when large amounts of the FIPV are present. This can result in a false negative test result. Therefore, this test must be interpreted in conjunction with results of other tests. These tests are listed below.

2. Serum Protein Levels. If the total serum protein is elevated at ≥ 7.8 gm/dL AND the A:G ratio (ratio of two different blood proteins) is < 0.6 , FIP becomes a more likely diagnosis. A few other diseases may also cause this, but these are also very severe and often fatal. These findings occur in 50% of the cases of FIP.

3. Abdominal/Chest Fluid Analysis. If fluid is present in either the chest or the abdomen, analysis of the fluid can be very helpful. If the characteristics of the fluid are appropriate and the cat has the correct clinical signs, a presumptive diagnosis of FIP can be made with greater assurance. Unfortunately, this fluid is not present in the dry form of FIP.

5. Radiographs (X-rays) of Chest or Abdomen. Radiographs serve to identify enlargements in organs and the presence of fluid in the chest or abdomen. They are helpful but not diagnostic and are used to decide which other tests are appropriate.

6. Changes in the eye including blindness and inflammation

7. Special laboratory test on the fluid.

Treatment

Many treatments have been tried for cats with FIP, but none have been consistently successful. Apparently, an occasional cat will recover, but this is the exception rather than the rule. Removing fluid from the chest or abdomen in cats with the wet form will make them comfortable for a short while, and a few drugs will make some of them feel better. Some of the available antiviral drugs have been tried alone and in various combinations. Human interferon has had some effect in prolonging the lifespan. Some of the other antiviral drugs are toxic and cannot be given to cats. There is no known curative treatment available.

Prognosis

The prognosis for a cat with FIP is very poor. Once a reasonably reliable presumptive diagnosis has been made, euthanasia is often the most appropriate course of action.

Transmission to Humans

The feline corona viruses are not transmitted to humans. They are species-specific.

Prevention

The coronavirus may live for up to 3 weeks in the environment. If viral shedding into the environment seems likely, a 1:30 mixture of household bleach and water (i.e., 1 cup of bleach in a gallon of water) should be used to disinfect food and water bowls, litter pans, cages, bedding material, and items that will not be adversely affected by household bleach.