

Parvovirus in Dogs

Canine Parvoviral Infection (CPV) is a highly contagious disease of dogs that was first diagnosed in the United States in June 1978. Cases were identified in late 1977 and early 1978 in Canada and Australia. The disease is considered to be worldwide. This relatively new disease attacks the cells of the intestinal tract, bone marrow, lymph glands and in some cases the heart muscle, especially in very young dogs.

Transmission

The parvovirus is shed in large numbers through the feces (stools) of infected animals. It is transmitted readily if a dog eats contaminated material.

The disease spreads quickly in dog colonies, kennels and places where dogs come in contact with other dogs. Subclinical cases (cases where the dog does not appear to be sick) keep the disease spreading by passing the virus of the disease in the feces. Dogs remain infective for about 3 weeks and shed virus during this period. After the dog recovers, chronic shedding apparently does not occur. The virus can easily be spread on shoes, clothing and equipment of persons who have contact with infected dogs. The virus is very resistant to detergents, freezing, thawing, heat, antibiotics, common disinfectants, chemicals and acid or alkali extremes. For this reason the virus can persist in a kennel for long periods. The virus can be killed by formalin or a dilution of 1 cup of Clorox in 2 gallons of water. Outbreaks have occurred in zoos among maned wolves, crab-eating foxes and a bush dog. There is no evidence of transmissions of this virus to man.

Clinical Signs

One form of parvoviral infection attacks the dog's digestive system and one attacks the heart. Dogs of any age can get the disease, but young dogs, 3 to 5 months of age, seem most likely to be infected. This disease appears more often in large breeds. The incubation period varies from 3 to 12 days but most often 5 to 7 days.

These clinical signs vary greatly. The animal may only appear depressed for 24 hours with temperatures of 104°F to 106°F, especially in young pups. Older dogs may have little or no rise in temperature. Diarrhea and vomiting may be the first signs, loss of appetite may happen simultaneously or later. At first, the feces appear slimy and pasty, then change to more watery with a gray to light brown or yellow color with or without blood streaks. In severe cases the stools are bloody. If the dog vomits and has diarrhea, it can become dehydrated. Death may occur in a matter of hours-the younger the animal, the more likely it is to die suddenly. Some dogs, especially older animals, may have only a loose stool and then recover.

The cardiac (heart) form occurs in young pups usually under 10 weeks of age. The clinical signs may be

listlessness, depression, elevated temperature, gagging and coughing or pups 2 to 8 weeks of age may be found dead having shown no previous clinical signs. Older dogs appear drowsy, dull and tire easily. This form often occurs without the digestive upset. It may occur 2 to 3 weeks after an apparent cure of the digestive form. All the pups in some litters may die. Some pups in the litters may show no obvious clinical signs.

Hidden mild cases are apparently common. Blood samples taken from street dogs show that 25 to 50 percent of these dogs had been infected.

A decrease in white blood cells is a common finding during the first 4 to 5 days of the disease, The greater the decrease in white blood cells, the greater the possibility that the dog will die.

In 40 parvovirus cases that were confirmed independently, all had diarrhea (more than half with blood), 85 percent had vomiting, 48 percent were dull and drowsy, 48 percent had loss of appetite, 45 percent had fever, 43 percent were dehydrated, 28 percent had decrease of white blood cells, 15 percent were sore in abdomen, 5 percent had convulsions 5 percent had ulcers in the mouth and 5 percent showed breathing difficulty

Deaths due to the heart form occur so rapidly that treatment is unsuccessful. This failure is due to the extensive heart damage before you notice any clinical signs. Dogs that survive the first symptoms may die of premature heart failure up to 6 months later.

Diagnosis

Evidence of rapid spread of diarrhea and vomiting in a group of dogs is a good sign that canine parvovirus should be considered. If vomiting, diarrhea, fever and a lowered white blood cell count are present, the parvovirus infection is a good possibility.

There are several other diseases of dogs that may have one or more of the same signs as parvovirus in dogs, which may make it difficult to pinpoint the cause.

The virus is a small one, and it is easy for scientists using an electron microscope to tell it from the coronavirus that damages the gut like the parvovirus.

The more extensive damage occurs in the bone marrow, lymph tissue, cells lining the intestine, and the heart muscle very early in life.

In the digestive form, the lower half to two-thirds of the small intestine is affected, the intestinal lining may look bloody, thickened with fluid and flabby. The gut often contains no food. The surrounding lymph nodes are frequently watery. In the cardiac form the heart appears flabby and watery with pale streaks in the muscle. The lungs may be filled with fluid and the liver thickened. Fluid may or may not be present in the abdomen and chest.

Microscopic lesions are diagnostic. Pieces of the intestine look very much like the intestine in feline panleukopenia (FPV) of cats. Distinct bodies inside the nucleus of cells may be found in the intestinal lining and the heart muscle. Evidence of new intestinal mucosal lining is often present even in cases that have died. Pathologists feel these microscopic lesions are a sure sign that parvovirus is present.

The diagnostic laboratories are very useful in confirming a diagnosis. The virus can be found in the feces by a special microscope or a fluorescent antibody test. Antibody titers can be determined on blood serum samples from suspected animals. Absolute confirmation of the infection is obtained by finding the virus in the stool.

Treatment

The treatment must be started as soon as possible to give the dog a good chance for recovery. It is important to keep the dog as comfortable as possible. Vomiting and diarrhea must be controlled. Do not give the dog food or water if it is vomiting. The body fluids lost through the vomiting and diarrhea must be replaced. Fluids should be given intravenously (I.V.) to combat the dehydration as quickly as possible. Secondary bacterial invaders should be controlled with broadspectrum antibiotics such as chloramphenicol, gentomycin and penicillin. The infected dog should be kept warm and be provided good nursing care.

Prevention

It is very difficult to get rid of parvovirus once the premises have become infected. Very careful cleaning and disinfection of kennels and other areas where dogs are housed help to control the spread of the virus. One cup of chlorox in 2 gallons of water is an effective disinfectant to kill the virus.

It is important to keep sick dogs separated from healthy ones. Recovered dogs are protected against reinfection and do not continue to pass viruses longer than the approximate 3-week infectious period. An infected dog develops a high, long-lasting antibody titer with little decline for at least 1 year.

Healthy dogs should be prevented from coming in contact with feces from other dogs as much as possible. Dogs should be kept away from other dogs where any cases of parvovirus are present.

Vaccination

With few exceptions, dogs of all ages should be vaccinated to prevent canine parvoviral infection. Since the parvovirus has been recognized only since 1978 and vaccine production is new, it has not been determined how long a vaccination protects a dog from the disease.

There are several companies developing vaccines of two different types:

Killed vaccines do not contain a live virus and are relatively free of side affects. The protection offered by this type of vaccine is not as great and does not last as long as the modified live vaccine.

Modified live vaccines contain a weakened virus causing a stronger reaction and longer protection than the killed vaccines. Sometimes a reaction can happen when using modified live vaccines.

Pups are protected from parvovirus by drinking their mother's milk (colostrum). This protection to the pups depends on how much protection the bitch has herself. However, this may interfere with vaccination.

Some pups may not be successfully vaccinated for as long as 12 to 14 weeks of age due to this protection from the mother, but pups respond to vaccination around 7 to 8 weeks of age.

For continuous protection, puppies should be vaccinated at 5 to 6 weeks of age with boosters every 3 weeks until 16 weeks of age. At least one injection should be given after 12 weeks of age. Adult dogs should have two initial doses 3 to 4 weeks apart followed by a single booster annually.

Revaccination of dogs is recommended 1 week before being placed in a kennel or dog show.

Consult your veterinarian before using any vaccine for parvovirus in dogs.

Cause

Canine parvovirus (CPV) is a very small virus that grows and reproduces readily on other cells but not on itself. This virus resembles the virus of a cat disease, feline panleukopenia (FPV), and of mink enteritis (MEV), a mutant of feline panleukopenia. The origin of canine parvovirus is still a mystery, but it may be a variant of feline panleukopenia. These two viruses react similarly in serum and resemble each other physically. Although they are alike, there have been no outbreaks of canine parvovirus that were associated with cats infected with panleukopenia and *vice versa*.

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by

J.E. Manspeaker, V.M.D.
Extension veterinarian

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