Parvovirus

By Dr. Christina Lock

Canine parvovirus (CPV) was first discovered in 1978. Canine parvovirus (CPV) is resistant to heat inactivation, unless heated to 80°C for one hour. Due to its resistance to heat inactivation, CPV remains infectious in soil containing fecal matter for months to years.

The pathogenesis of CPV begins with transmission typically through the fecal oral route. Transmission occurs when an uninfected dog ingests the infected feces of another dog. Although, transmission can also occur by the infective virus being carried out on the dog’s hair and feet, on the clothing and footwear of the dog owner’s, by insects, or across the placenta. Once the virus has entered the dog’s system, replication can only occur in dividing host cells, which are typically in the bone marrow, lymphoid tissues, intestines, and the heart in young puppies.

Primary replication occurs in the lymphoid tissues of the throat, abdominal lymph nodes, and the thymus. The virus then spreads through the bloodstream to the bone marrow, other lymphoid tissues, intestines, and/or heart depending on the age of the dog.

Intestinal epithelium infection doesn’t occur until the fourth day of infection. As the intestinal epithelium is destroyed by the virus, the canine will begin to have reduced nutrient absorption along the intestinal tract, resulting in anorexia, vomiting, and diarrhea. The destruction in the intestinal epithelium also can result in secondary bacterial infections due to the loss of the protective barrier keeping the bacteria within the intestinal tract and from entering the bloodstream.

Active excretion of the CPV in feces starts on the third day of infection, which is before clinical signs are presented. Shedded viral particles continue to increase in the feces until the fifth or sixth day of infection. The virus can be detected in the stool until 8-12 days post infection where there ceases to be detectable amounts.

**CLINICAL SIGNS AND DIAGNOSIS:**

Clinical signs can be observed 4-7 days after exposure. Initial signs may be vague with presentation of lethargy, depression, anorexia, and fever followed by vomiting and diarrhea. Diarrhea is only presented in 50 percent of the patients. In severe cases, reduction in the number of circulating white blood cells is seen at 3-5 days. The myocardial form affects puppies infected with CPV under eight weeks of age. If the puppy survives, they may die from congestive heart failure in months to years later, due to the extensive damage to the heart by CPV.
A tentative diagnosis is formed from the patient’s history, physical exam, and laboratory tests. A definitive diagnosis is reached by an in-office ELISA test being used to measure the active secretion of the virus or the presence of the viral antigen in the feces.

TREATMENT:

Treatment of canine parvovirus is supportive only, because there is no cure. Treatment usually consists of resting the intestinal tract, correcting the fluid and electrolyte imbalances, supplying parenteral nutrition and fluid needs, and to control secondary infection. Fluid therapy is usually given intravenously to prevent dehydration and to replace the fluids lost through diarrhea and vomiting. The fluid therapy typically lasts until the dog is able to hold down water and food. To rest the intestines and allow them to recover, food and water is not given to the dog for 24 to 72 hours. Antibiotics may be given in severe cases to control secondary infection, due to the virus affecting the immune system with the destruction of the lymphoid and bone marrow tissue. Bacterial invasion may occur with the loss of the intestinal barrier from the destruction of the intestinal epithelium. Antiemetic medications may be prescribed to prevent vomiting, and antacids may be given to prevent damage to the esophagus from vomiting acidic fluids.

Prognosis of CPV infected dogs is dependent on their immune system and the degree of illness. If an infected dog receives medical treatment, and can survive the first few days of treatment, then the prognosis is good. However, if the infected puppy is between 6-18 weeks of age and doesn’t receive medical treatment, then the prognosis is poor. Poor prognosis typically ends with the animal being euthanized. The mortality rate of young dogs over the age of eight weeks is 10 percent, whereas death is rare in older dogs.

PREVENTION:

Canine parvovirus is a disease that doesn’t have a cure, but can be prevented with vaccination of young puppies. The vaccine consists of the inactivated virus, either a killed virus or a modified live virus that doesn’t cause infection, but stimulates an immune response in the puppy. The puppy may receive some protection from maternal antibodies up to 16 weeks of age, however the puppy should receive a series of vaccinations at 8, 12, and 16 weeks of age. The puppy is not protected from CPV until the vaccination series has been completed. Maternal antibodies have the ability to inactivate the vaccine. There tends to be a week of vulnerability when the maternal antibodies are too low to protect the puppy from CPV, but high enough to inactivate the vaccination. To ensure protection from CPV the puppy should not ve any contact with infected dogs or contaminated environments until the vaccination series is completed.

REFERENCES


