



Canine Parvovirus: Manifestations, Prevention & Control

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Abstract

Canine parvovirus is an important viral disease of canines which can lead to heavy mortality in dogs. Usually this disease occurs in dogs which are unvaccinated or in very few cases can occur in dogs that are vaccinated but becomes immunosuppressive due to other diseases. The disease mainly produces effects on gastrointestinal system of canines but can also affect the heart in puppies. No specific treatment of the disease exists thus the treatment is mainly symptomatic in the affected dogs.

Keywords: Viral Disease; Vaccination; Gastrointestinal System; Heart

Introduction

Canine parvovirus (CPV) type 2 is a member of the Parvoviridae family and has emerged about forty years as the leading cause of acute gastroenteritis in puppies. Its high contagiousity and high rates of morbidity and mortality have granted it a great importance in Veterinary Medicine and considered as a new pandemic pathogen of dogs. Canine parvovirus is a highly contagious disease that spreads easily from dog to dog by direct or indirect contact with their faeces [1]. Dogs become infected through oral contact with canine parvovirus in faeces, infected soil or fomites. The virus attacks rapidly dividing cells such as those in the lymph nodes, intestinal lining and the bone marrow [2]. This results in depletion of the white blood cells necessary for the immune system to function, delaying the recovery of infected puppies. The rapid death of the intestinal cells results in the sloughing of the intestinal lining, vomiting, diarrhoea and severe intestinal bleeding. This may eventually lead to the death of your puppy if left untreated.

Forms of canine parvovirus in dogs

The infection caused by canine parvovirus produces two different clinico-pathological forms of the disease. They are

- An intestinal form, which is the main form
- A cardiac form, which is rare in case of dogs (only found in young puppies)

Intestinal form

- This form of infection occurs in dogs of all ages but is most severe in dogs older than 6 weeks of age. It is characterized by vomiting, diarrhoea, and dehydration.

- Other signs of infection also include fever and leukopaenia.
- Microscopically, there is a necrotizing enteritis of the small intestine like that of feline panleukopaenia, with dilated crypts and regeneration of epithelium. Intranuclear inclusion bodies are found in intestinal epithelial cells.
- Lesions in lymphoid organs include regression of the lymph nodes or atrophy of lymph organs all over the body which decreases the immunity of the dog to fight the infection.
- There is lymphopenia and neutropenia resulting from necrosis of precursor cells. These signs and lesions may occur together with the cardiac form.

Cardiac form

- The cardiac form is confined to puppies of 2-8 weeks of age, i.e., in younger dogs. This form may exist with, or without, signs or lesions in the small intestine.
- Clinically, death may be sudden, or follow a brief period of dyspnea and sometimes signs of enteritis.
- Microscopically, there are multiple foci of myocardial necrosis associated with a mononuclear cellular infiltration [1].
- Intranuclear inclusion bodies are present in muscle fibres.
- At times, canine parvovirus in neonates may cause generalized infection with necrotizing lesions and inclusion bodies in tissues other than the gastrointestinal tract and heart, such as brain, liver, lungs, kidneys and adrenal cortex.
- Vascular endothelium is severely affected, causing the lesions to be haemorrhagic [1].

Clinical signs

- Signs of the parvovirus include loss of appetite, fever, lethargy, vomiting and severe diarrhea which may contain blood.
- Vomiting and diarrhea may cause dehydration and shock, which can result in death. The disease strikes young dogs more often than adults.
- Another, less common form of parvoviral infection is myocarditis (inflammation of the heart). Myocarditis is most often seen in puppies younger than three months of age. Because the virus multiplies quickly in heart muscle cells, diarrhea is not usually seen.
- Puppies may become lethargic and stop eating just before collapsing, gasping for breath.
- Death can occur within minutes or several days. No specific treatment is known.
- Puppies that survive usually have permanent heart damage. A dog may die of heart failure weeks or months after apparent recovery.
- Immunization of the bitch protects puppies early in life; therefore, vaccination of breeding animals is very important [2].

How is canine parvovirus diagnosed and treated?

- Veterinarians diagnose canine parvovirus on the basis of clinical appearance and laboratory tests. No specific drug is available that can kill the virus in infected dogs.
- Treatment should be started immediately and consists primarily of efforts to combat dehydration by replacing electrolyte and fluid losses, controlling vomiting and diarrhea, and preventing secondary infections.
- Sick dogs should be kept warm, receive good nursing care, and be separated from other dogs.
- Proper cleaning and disinfection of contaminated kennels and other areas where infected dogs are housed is essential to control the spread of parvovirus.
- Canine parvovirus is not easily killed, so consult your veterinarian for specific guidance on cleaning and disinfecting agents.

Prevention and control

- **Indoors:** Contaminated areas should be thoroughly cleaned with household bleach (one part bleach diluted with 30 parts water) or with a commercial product specifically labeled for use against parvovirus. Food and water bowls, toys, bedding, and any other surfaces or items that are colorfast (or where color change is not important) should be disinfected. Contaminated clothing and shoes may also need to be disinfected. Indoors, the virus usually loses its infectivity in about one month. Especially in carpeted areas, at least 30 days should pass before a new puppy can be safely introduced into a household.

- **Outdoors:** Dogs should not be allowed to come in contact with feces or other dogs when in a park or on the street. Immediate waste disposal is recommended. If good drainage is available, a thorough watering-down of the contaminated area may dilute any existing virus. Without thorough decontamination measures, a site is considered contaminated
- For seven months if shaded;
- For five months with good sunlight exposure; and
- Until the space is thoroughly thawed, if frozen. (Freezing protects virus.)

Vaccination

- Vaccination is important. Young puppies are very susceptible to infection, particularly because the natural immunity provided in their mothers' milk may wear off before the puppies' own immune systems are mature enough to fight off infection [3].
- If a puppy is exposed to canine parvovirus during this gap in protection, it may become ill. An additional concern is that immunity provided by a mother's milk may interfere with an effective response to vaccination. This means even vaccinated puppies may occasionally succumb to parvovirus.
- To narrow gaps in protection and provide optimal protection against parvovirus during the first few months of life, a series of puppy vaccinations are administered. To protect their adult dogs, pet owners should be sure that their dog's parvovirus vaccination is up-to-date. Ask your veterinarian about a recommended vaccination program for your canine companion [3].
- In spite of proper vaccination, a small percentage of dogs do not develop protective immunity and remain susceptible to infection.
- Hygiene—Until a puppy has received its complete series of vaccinations, pet owners should use caution when bringing their pet to places where young puppies congregate (e.g. pet shops, parks, puppy classes, obedience classes, doggy day-care, and grooming establishments). Reputable establishments and training programs reduce exposure risk by requiring vaccinations, health examinations, good hygiene, and isolation of ill puppies and dogs. Contact with known infected dogs and their premises should always be avoided.

Conclusion

Finally, do not allow your puppy or dog to come into contact with the fecal waste of other dogs while walking or playing outdoors.

Prompt and proper disposal of waste material is always advisable as a way to limit spread of canine parvovirus infection.

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