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Canine Parvovirus Infection

Basics

OVERVIEW

- Canine parvovirus (CPV) infection is characterized clinically by lack of appetite, vomiting, diarrhea, and weight loss; severe disease may result in generalized bacterial infection (known as "sepsis"), presence of bacterial toxins in the blood (known as "endotoxemia"), blood clotting disorder (known as "disseminated intravascular coagulopathy" or DIC), and acute respiratory distress syndrome (ARDS)
- The original canine parvovirus underwent genetic alterations, developing into CPV-1 and CPV-2; CPV-2 developed further into CPV-2a in 1979, and CPV-2b in 1984, and CPV-2c in 2001
- Most severe disease is associated with CPV-2b
- CPV-1 may cause unmanageable, usually fatal diarrhea in newborn puppies

GENETICS

- Unknown

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs
- Cats—can be infected with CPV-2b

Breed Predilections

- Rottweilers, Doberman pinschers, pit bulls, Labrador retrievers, German shepherd dogs, English springer spaniels, Alaskan sled dogs are considered to be more susceptible to canine parvovirus infection than are other breeds of dog

Mean Age and Range

- Most cases are seen between 6 weeks and 6 months of age
- More severe disease is seen in younger puppies
- Incidence has decreased dramatically with vaccination of puppies against parvovirus

SIGNS/OBSERVED CHANGES IN THE PET

- Loss of energy, sluggishness (lethargy), lack of appetite (known as "anorexia"), vomiting, and profuse diarrhea with rapid, severe weight loss
- Rapid heart rate (known as "tachycardia")

- Moist tissues of mouth and eyes (known as “mucous membranes”) may be pale or deep red, due to the blood vessels being filled with blood (known as being “injected”), or yellowish (known as being “icteric” or “jaundiced”)
- Dehydration
- Pain or discomfort when the veterinarian feels the abdomen (known as “abdominal palpation”)
- Intestines may be fluid filled, or rarely, the veterinarian may detect the folding of one segment of the intestine into another segment (known as “intussusception”)
- May have a fever or the body temperature may be lower than normal (known as “hypothermia”)
- May exhibit vomiting/diarrhea in the examination room

CAUSES

- CPV-2b (canine parvovirus-2b) infection

RISK FACTORS

- Breed predisposition as listed under “Breed Predilections”
- Possible simultaneous conditions, diseases or drug therapy that lead to an inability to develop a normal immune response (known as “immunosuppression”), such as **heavy parasitism**
- Incomplete vaccination protocol, vaccine failure, or normal interference of the puppy developing protective antibodies due to the presence of maternal antibodies
- Breeding kennels, pounds, shelters, and areas with a high number of puppies without adequate immune response or inadequately vaccinated puppies

Treatment

HEALTH CARE

- Hospitalization for intensive therapy and supportive treatment significantly improves survival
- Hospitalized pets must be kept isolated from other pets; hospital personnel must follow proper cleaning and disinfecting practices to prevent spread of the virus
- Intravenous fluid therapy is a mainstay of treatment; fluid rates must account for maintenance needs plus ongoing losses, which may be profound due to vomiting and diarrhea

ACTIVITY

- Activity should be restricted until puppies are recovering

DIET

- Food and water should be withheld if vomiting
- Small amounts of water may be introduced after 24 hours with no vomiting
- Nutrition utilizing some type of feeding tube (known as “enteral nutrition” or “microenteral nutrition”) should be considered in pets with lack of appetite (anorexia) of 3–4 days in duration; early enteral nutrition may improve clinical outcome
- A bland, easily digestible diet (such as Hill's Prescription Diet i/d) should be fed initially, with gradual transition to the normal ration

SURGERY

- The only surgical indication is for treatment of the rare complication of intestinal intussusception (the folding of one segment of the intestine into another segment)

Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Drugs to stop vomiting (known as “antiemetics”)—very frequently needed due to prolonged vomiting;
- H2-blockers—may reduce nausea;
- Antibiotics—to combat generalized bacterial infection (known as “sepsis
- Medications (known as “anthelmintics”) to eradicate intestinal parasites
- Pain relievers (known as “analgesics”)—may be needed in severely affected pets

Follow-Up Care

PREVENTIONS AND AVOIDANCE

- Vaccination against canine parvovirus has been effective at drastically reducing disease incidence
- Modified live (high-titer) vaccines are recommended for puppies to minimize interference from maternal antibodies
- Interference from maternal antibodies is the main reason for vaccine failure; some puppies may have maternal antibodies present in their blood for up to 18 weeks of age
- **Protocols recommend vaccinating at 6, 9, 12, and 16 weeks of age**
- High-risk breeds may require a longer initial vaccination protocol against canine parvovirus, extending up to 22 weeks of age

POSSIBLE COMPLICATIONS

- Generalized bacterial infection (sepsis)
- Presence of bacterial toxins in the blood (endotoxemia)
- Shock
- Intussusception (the folding of one segment of the intestine into another segment)
- Blood clotting disorder (disseminated intravascular coagulopathy)
- Acute respiratory distress syndrome (ARDS)

EXPECTED COURSE AND PROGNOSIS

- If the puppy recovers, recovery is typically complete; immunity following canine parvovirus infection is long term and may be lifelong
- Mortality is primarily due to the presence of bacterial toxins in the blood (endotoxemia)
- Aggressive therapy improves survival, but mortality rates may still approach 30%

Key Points

- Canine parvovirus is very stable in the environment, but may be destroyed by use of 1:30 bleach solution
- Vaccination does not produce immediate immunity, so susceptible puppies should be kept isolated
- Mortality is primarily due to the presence of bacterial toxins in the blood (endotoxemia)
- Aggressive therapy improves survival, but mortality rates may still approach 30%

Notes

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