

Parvovirus Infection

PLEASE DO NOT GIVE ANY THERAPY OR MEDICATIONS WITHOUT CONSULTING WITH YOUR Foster Manager

Diagnosis

A puppy with a bloody diarrhea could have a parasite problem, a virus other than parvovirus, stress colitis, an intestinal foreign body, or may simply have eaten something that disagreed with him. It is important to confirm the diagnosis of parvovirus before embarking on what could be the wrong treatment.

Common ways to test for Parvo are the fecal ELISA test & CBC

Note: testing 5-12 days after vaccination can interfere with the test result.

Further, the puppy could be infected but no longer shedding virus in its stool. Or the Virus particles may be so thoroughly coated with antibodies that they cannot react with the chemicals of the test.

Treatment

Treatment for parvoviral infection centers on supportive care. This means that the clinical problems that come up during the infection are addressed with the goal of keeping the patient alive long enough for an immune response to generate. We do not have reliable antiviral drugs and must rely on the patient's immune system for cure.

1. The Basics

Fluid Therapy

One of the ways parvo can kill is via the metabolic derangements that occur with extreme dehydration. It is crucial to replace the vast fluid losses (from vomiting and diarrhea) with intravenous fluids. Fluids are given as a steady drip rather than simply under the skin so that absorption into the circulation is direct. Potassium is usually added to the fluids in order to maintain electrolyte balance. Dextrose (sugar) is also frequently added as the stress of the disease may lower blood sugar, especially in a small puppy.

Antibiotics

The important thing is that antibiotics are given. Antibiotics are taken directly to the battlefield of the infection in the intestine where bacteria are attempting to invade. Since the patient's white

blood cell count is typically drastically reduced during the height of the parvo infection, we are relying on antibiotics to keep the bacteria out. There are times when puppies have uncontrolled vomiting and they must be hospitalized to receive IV antibiotics.

Control of Nausea

Patient comfort is an important part of treatment for any disease but is especially important for parvo treatment as these puppies feel extremely nauseated. Again, the GI tract is too damaged for oral medication so medications are given as injections. There are several popular medications for nausea control:

Metoclopramide: (best given as a continuous drip in the IV fluid set up.) If used as separate injections, relief tends to be short lasting and does not provide around the clock control. If a continuous drip is used, nausea control lasts as long as the drip is running.

Chlorpromazine: a strong nausea control medication that lasts 6 to 8 hours per injection and has the added benefit of a drowsiness side effect (so patients can sleep through most of this uncomfortable time).

Ondansetron and dolasetron: These injectables are especially strong anti-nausea medications. In the past, expense has made these medications uncommon but recent generics have made them readily available. Ondansetron is typically given two to three times daily while dolasetron is given only once daily.

Maropitant (brand name: Cerenia®): This powerful anti-nausea has not been adequately tested in puppies under 16 weeks of age. For older puppies, this should be an excellent choice to improve patient comfort. It is given once daily.

The vomiting typical of parvo infection is not only uncomfortable but can ulcerate the esophagus. The disease itself ulcerates the stomach and small intestine. Medications called gastroprotectants help heal ulcers and help minimize their formation. These medications include the injectable antacids (cimetidine, ranitidine, or famotidine) as well as sucralfate, which forms webbing over ulcers to facilitate healing.

2. Monitoring

The following tests are helpful in adjusting parvovirus treatment:

Fecal flotation to rule out worms/internal parasites

The last thing these patients need is a parasite burden contributing to their nausea and diarrhea. Since parvo victims are puppies and puppies are high risk for parasitism, it is important to test for worms and microbes that can contribute to the GI upset and eliminate any.

Alternatively, puppies can be dewormed with a broad spectrum product or products to be sure that internal parasites are not contributing to illness.

White blood cell counts/complete blood counts

One of the first acts of the parvovirus is to shut down the bone marrow production of immunologic cells (the white blood cells). White blood cell counts are often monitored as the infection is followed. The white blood cell count bottoms out at the height of the viral infection and recovers as the patient's immune system gains the upper hand. Following the white blood cell count is helpful in determining the patient's ability to recover.

Urine specific gravity/Azostix

In order to assess the effectiveness of the fluid therapy, some objective evaluation of dehydration is useful. If adequate IV fluids have been provided then the urine produced will be dilute (as measured by specific gravity) and Azostix measures of protein metabolites, which build up in the blood stream, should be at normal levels.

Abdominal Palpation

Abnormal motility of the intestines occurs with this infection. Sometimes an area of intestine actually telescopes inside an adjacent area in a process called intussusception. This is a disastrous occurrence as intussusception can only be treated surgically and parvo puppies are in no shape for surgery. Euthanasia is usually elected in this event.

Total blood protein

Protein depletion is common when there is heavy diarrhea. If blood proteins drop too low, certain IV fluids or even plasma transfusions are needed to prevent massive life-threatening edema.

Extra Treatment that May Help

Tamiflu® (Oseltamivir)

While this particular addition to the parvo treatment plan has not universally caught on everywhere, news of Tamiflu's efficacy has spread far and wide. This oral medication is typically given for 5 days starting as soon as the diagnosis is made. It interferes with the reproduction of the parvovirus so that the patient's immune system essentially has fewer enemy soldiers to combat. This medication is helpful in the treatment of parvo patients plus it can prevent development of the disease when given to exposed puppies. The key is to begin this treatment before the virus has had a chance to maximize its numbers; if treatment is started later in the infection, there may be so many viral particles that little benefit can be realized.

Plasma Transfusions

Plasma is the protein-rich fluid that remains when the red blood cells are removed from a sample of blood. These proteins may include antibodies against the parvovirus, albumin to help expand the patient's blood volume, as well as other healing proteins. Plasma can be obtained from donor dogs in the hospital or can be purchased from animal blood banks.

Septi-Serum

This product represents anti-serum (antibodies extracted from horses) that binds the toxins of any invading GI tract bacteria. The use of this product is controversial though the veterinary teaching hospital at Auburn University uses it commonly. It is usually given only one time as the equine origin of the product has potential for serious immunological reactions.

Anti-Inflammatory Drugs

There have been many studies indicating the benefits of single doses of these medications in the prevention of septic shock. Repeated doses may cause further GI ulceration (which is obviously something a parvo puppy has enough of). The usual medication is flunixin meglumine (Banamine®).

Neupogen

Neupogen is the brand name of a genetically engineered hormone called granulocyte colony stimulating factor. This hormone is responsible for stimulating the bone marrow to produce white blood cells and its administration easily overcomes the bone marrow suppression caused by the parvovirus. In other words, Neupogen helps the white cell count recover. A recent study did not find increased survival with the addition of this product to the parvo regimen; however, in sicker puppies it may make a significant difference. It is expensive.

Home Treatment for Parvo

Home treatment for parvo infection is a bad idea compared to hospitalization and intensive care. Mortality rises substantially and the heavy diarrhea and vomiting lead to heavy viral contamination in the home. Still, if financial concerns preclude hospitalization, home care may be the puppy's only chance. Fluids will have to be given under the skin at home as will injectable medicines. If home treatment turns out to be the only option, ask your veterinarian about how to accomplish this. It is not a simple undertaking and mortality rates run high.

Caring for the Recovered Dog

Medications

Your puppy will be finishing up a course of antibiotics and may also be on some medication for nausea or diarrhea. It is important that you give your puppy the medication prescribed for the full amount of time it has been prescribed.

Diet

- Your puppy is recovering from some extensive damage to the intestinal tract. It is typical for stool to be a little loose at first or for no stool to be produced for a few days as the tract recovers. The stool should gradually firm up over the first 3 to 5 days at home, and your puppy should be active and have a normal attitude. If the diarrhea persists, if vomiting occurs, or if your puppy seems depressed, please contact your veterinarian at once for instructions.
- Your puppy may be ravenously hungry after going so long without food. Do not allow the puppy to gorge as this can result in vomiting or diarrhea. Feed smaller meals separated by at least an hour or two.
- Do not feed table scraps. Stick to the diet recommended by your veterinarian. A therapeutic diet may have been sent home or a home cooked diet may have been recommended (such as boiled chicken and white rice, or fat-free cottage cheese and pasta). It is important for your puppy's food to be easily digestible, so stick to the protocol your veterinarian has recommended.

Exercise

Your puppy should be considered contagious to other puppies for a good month so it is important to play it safe by restricting trips to the park, obedience school or other neighborhood areas. If your puppy is less than 16 weeks of age, she should not be allowed in public areas until the vaccination series is fully completed.

Other Pets

Humans are not susceptible to canine parvovirus infection though some strains can be contagious to cats. Adult dogs that have been vaccinated are not susceptible either. Introducing new puppies poses a problem as the parvovirus persists a long time in the environment; if possible, only puppies that have completed their vaccination series should be introduced. Any obviously contaminated material should be removed (fecal- or vomit-contaminated objects that cannot be bleached, any remaining areas of feces, etc.) For more details, learn about disinfecting the environment.

Bathing

Your puppy may be bathed any time as long as you do not allow her to get cold or chilled after the bath. Bathing will reduce the amount of virus left on her fur and will help reduce contagion.

Resuming Vaccines

Follow your veterinarian's recommendations. Your puppy cannot be re-infected with this virus for at least 3 years (and probably is protected for life simply by virtue of this infection) but there are other viruses that your puppy should be protected against. Your veterinarian will give you a vaccination schedule for the future.

There should be no permanent ramifications due to this infection.

The recovered puppy should lead a normal life once the recovery period is completed (1-2 weeks).

Disinfecting the Environment

Because the canine parvovirus is not enveloped in a delicate but necessary covering of fat the way the distemper virus is, canine parvovirus is especially hardy in the environment. It is readily carried on shoes or clothing to new areas (which accounts for its rapid worldwide spread shortly after its original appearance). It is able to overwinter freezing temperatures in the ground outdoors, plus many household disinfectants are not capable of killing it indoors.

Given that this is such a tough virus to destroy, many people want to know exactly what they must do to disinfect an area that has contained an infected dog or how long they must wait before safely introducing a new dog to a previously contaminated area.

Here is what we know about how contaminated an environment is likely to be:

- Infected dogs shed virus (in their stool) in gigantic amounts during the 7 to 10 days following exposure. Because such enormous amounts of virus are shed, there is a HUGE potential for environmental contamination when an infected dog has been there.
- It is important to realize that because the canine parvovirus is so hardy in the environment, it is considered ubiquitous. This means that NO ENVIRONMENT is free from this virus unless it is regularly disinfected.

A parvoviral infection can be picked up anywhere, although it is easier to pick up an infection in an area where an infected dog has been simply because of the larger amounts of virus in a contaminated area.

- Whether an individual dog gets infected or not depends on the number of viral particles the dog experiences, what kind of immune experience the dog has had with the virus before (vaccinated? previously infected? how much past exposure?), and how strong the individual dog is (stress factors, diet, etc.)

A typical/average infectious dose for an unvaccinated dog is 1000 viral particles. For some dogs far less is needed. For other dogs, far more is needed. An infected dog sheds 35 million viral particles (35,000 TIMES the typical infectious dose) per OUNCE of stool.

Environmental Decontamination

Indoor decontamination:

- Indoors, virus loses its infectivity within one month (assuming room temperature or higher is maintained); therefore, it should be safe to introduce a new puppy indoors one month after the active infection has ended.

Outdoor decontamination:

- Freezing is completely protective to the virus. If the outdoors is contaminated and is frozen, you must wait for it to thaw out and warm up before safely introducing a new puppy.
- Shaded areas should be considered contaminated for seven months.
- Areas with good sunlight exposure should be considered contaminated for five months.

Of course, the above presupposes that no decontamination steps (other than waiting) have been taken. In most households, owners want to know how to disinfect their homes to create a safer environment for the other dogs there or to create a safe environment for a new or replacement puppy.

Here's what we know about disinfection:

- Despite the introduction of new cleaners with all sorts of claims, parvovirus remains virtually impossible to completely remove from an environment. The goal of decontamination is to reduce the number of viral particles to an acceptable level.
- The best and most effective disinfectant against viruses, including parvoviruses, is BLEACH. One part bleach is mixed with 30 parts water and is applied to bowls, floors, surfaces, toys, bedding, and anything contaminated that is colorfast or for which color changes are not important. At least 10 minutes of contact time with the bleach solution is needed to kill the virus. Steam cleaning is also able to kill the virus.

Bleach completely kills parvovirus

- Disinfection becomes problematic for non-bleachable surfaces such as carpet or lawn. Outdoors, if good drainage is available, thorough watering down of the area may dilute any virus. For carpet, disinfection is about temperature. If the temperature on the floor and in the carpet is at least room temperature then the virus should die off in approximately one month.

WHEN IN DOUBT, MAKE THE NEW PUPPY AN OLDER INDIVIDUAL (16 WEEKS OR SO) WHO HAS ALREADY COMPLETED HER VACCINATION SERIES.

Resources

<https://www.vin.com/apputil/project/defaultadv1.aspx?id=4951462&pid=19239&catid=&said=1&publicpath>

<https://www.vin.com/apputil/project/defaultadv1.aspx?id=4951460&pid=19239&catid=&said=1&publicpath>

<https://www.vin.com/apputil/project/defaultadv1.aspx?id=4951465&pid=19239&catid=&said=1&publicpath>