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Case Report

A Successful Treatment of Feline Panleukopenia

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Abstract

This article introduces a novel approach to treating feline panleukopenia, a highly contagious and life-threatening disease in cats. Instead of relying solely on traditional supportive care such as fluid therapy, antiemetics, and antibiotics, this study explores the use of filgrastim, a granulocyte colony-stimulating factor, to improve survival rates in cats suffering from severe leukopenia and neutropenia. The case report documents the successful treatment of five domestic cats with feline panleukopenia using filgrastim in conjunction with other forms of supportive care. This promising treatment protocol has the potential to significantly improve the prognosis for cats diagnosed with this devastating illness.

Keywords: Feline; Panleukopenia

Introduction

Feline panleukopenia is a deadly and easily transmissible disease that poses a significant threat to cats worldwide. The feline parvovirus,is responsible for this disease, which primarily affects young cats who are unvaccinated. Feline panleukopenia causes a rapid and extensive loss of white blood cells, leading to a weakened immune system and leaving cats vulnerable to secondary infections. While supportive care like fluid therapy, antiemetics, and antibiotics is the standard treatment for feline panleukopenia, studies show that filgrastim, a granulocyte colony-stimulating factor, can significantly improve survival rates in cats with severe leukopenia and neutropenia. In this article, we will delve deeper into the causes, symptoms, and treatment options of this highly infectious disease that affects feline populations worldwide.

Case Report

Five domestic ND cats were presented to the Veterinary Hospital with a history of vomiting, diarrhea, and lethargy for three days. Owner reported that he lost 3 kittens last year due to similar symptoms.

During the physical examination, the animal appeared weak and exhibited a calm behavior with a dull and depressed expression. The body condition was emaciated, and the skin and haircoat were rough. The respiration was weak, and the abdomen was tucked up, with a recumbent posture and gait. No abnormal acts were observed. Further examination revealed a fever of 104.5°F and above and severe dehydration, and blood work indicated leukopenia, agranulocytosis, lymphopenia, hypokalemia, hypernatremia, and thrombocytopenia. Hematology values showed a white blood cell count of 4.1*10^3/microlitre, with 14% lymphocytes, 350/microlitre monocytes, and 3.4*10^4 micro litre granulocytes. The red blood cell count was 8*10^6/micro litre, with a potassium level of 3.01 mEq/l and a sodium level of 170 mg/dL. Feline panleukopenia virus was confirmed by PCR testing.

Filgrastim (Neupogen) was administered subcutaneously at a dose of 4.3 mcg (0.03ml) on the 1st, 2nd, 3rd, 5th, and 6th days, at a rate of 6 mcg per kg. Penicillin G procaine was given intramuscularly at a dose of 72000 units (20000 units per kg) for 5 days. Pantoprazole and ondansetron were both administered intravenously at a dose of 0.9ml and 0.5mg/kg, respectively. Fluids DNS and RL were given intravenously at a dose of 36ml at 10ml/kg BID. Polybion was given intramuscularly at a dose of 0.5ml for below 15kg, and potassium chloride (potchlor) was also given. The cat's temperature was closely monitored and kept below 103.5 F throughout the treatment. Same treatment followed for other 4 cats of the same cattery which tested positive for fecal antigen test of Feline panleukopenia.

After five days of treatment one cat succumbed and other 4 cats showed significant clinical improvement. They became more alert, started eating and drinking, and had normal bowel movements. The cats were monitored closely for any adverse effects.The owners were instructed on the continued administration of subcutaneous filgrastim for three more days at home. Follow-up blood work performed one week after discharge showed complete resolution of leukopenia and neutropenia, and the cats remained clinically healthy [1].

Discussion

Feline panleukopenia, also known as feline distemper or feline infectious enteritis, is a highly contagious viral disease that affects cats worldwide. It is caused by the feline parvovirus, a small, non-enveloped DNA virus that is closely related to the canine parvovirus.

The virus is very hardy and can survive in the environment for several months. It is transmitted from cat to cat through direct contact with bodily fluids, such as saliva, feces, urine, or blood. It can also be spread indirectly through contaminated objects, such as food and water dishes, bedding, and litter boxes. Pregnant cats can transmit the virus to their kittens in the womb or through their milk. Feline panleukopenia primarily affects young cats, especially those that are not vaccinated. However, adult cats can also be affected, especially if they have a weakened immune system. Symptoms of the disease usually appear within 5-10 days after infection and include Fever, lethargy, loss of appetite, vomiting, diarrhea (which may be bloody), dehydration, anemia, weakness, seizures.

The pathogenesis of FPV starts when the virus enters the body of a susceptible cat through the oronasal route. The virus then multiplies rapidly in the oronasal pharynx, and from there it spreads throughout the body through the bloodstream.

The first tissues to be affected are the rapidly dividing cells in the bone marrow, which produce white blood cells (leukocytes). As a result, there is a significant decrease in the number of circulating white blood cells in the body (leukopenia). This weakens the cat's immune system and makes them vulnerable to secondary infections. The virus also infects the lymphoid tissues (such as lymph nodes, spleen, and thymus) that play an important role in the immune response, leading to lymphopenia (a reduction in the number of lymphocytes) [2].

The intestinal epithelium is also affected, resulting in the loss of the villi that are responsible for nutrient absorption, leading to diarrhea and dehydration. In very young kittens, the virus can also infect the cerebellum and retina, leading to neurological signs such as ataxia, tremors, and blindness. The severity of the disease can vary depending on the age, immune status, and general health of the infected cat. Kittens younger than six months of age and cats with weakened immune systems are most susceptible to severe disease and death.

Filgrastim is a medication that belongs to a class of drugs known as granulocyte colony-stimulating factors (G-CSFs). The mechanism of action of filgrastim in feline panleukopenia is based on its ability to stimulate the production and maturation of neutrophils, a type of white blood cell that is important for fighting infections. Neutrophils are produced in the bone marrow and are released into the bloodstream when they are needed to fight an infection. In cats with feline panleukopenia, the virus can infect and kill the cells in the bone marrow that produce neutrophils, leading to a decrease in the number of neutrophils in the blood. This can make it difficult for the cat to fight off infections and can increase the risk of secondary bacterial infections. Filgrastim works by binding to specific receptors on the surface of neutrophil precursor cells in the bone marrow. This binding stimulates the production and maturation of neutrophils, leading to an increase in the number of these cells in the blood. This increase in neutrophils can help the cat to fight off infections and reduce the risk of secondary bacterial infections. In addition to its effects on neutrophils, filgrastim may also have other effects on the immune system that could be beneficial in feline panleukopenia. For example, it may help to stimulate the production of other types of white blood cells, such as monocytes and lymphocytes, which are also important for fighting infections. In this case report, filgrastim was administered subcutaneously for five days to 5 cats with severe leukopenia and neutropenia due to feline panleukopenia. The treatment was well-tolerated, and the 4 out of 5 cats showed rapid clinical improvement, complete resolution of leukopenia and neutropenia, and continued good health at follow-up [3].

Treatment protocol

- Identify FPV with parvo test or WBC count and symptoms. Parvo test any severely sick or deceased kitten or cat with unknown sudden cause of death. Isolate sick cats.
- Start filgrastim, and give on days 1, 2, and 3 (optional), skip a day and resume on days 4 or 5.
- Start two broad spectrum antibiotics.
- Start Vitamin B12 or highly diluted Vitamin B-complex.
- Give fluids, anti-vomit meds, and feed in small amounts.
- Keep track of temperature throughout. Keep at or below 103.5 F, but a modest elevated temperature is good.
- Continue with supportive therapy and antibiotics for full course of treatment. (Typically, 7 days, or 3 days past all symptom resolution, but at least a minimum of 5 days).
- Cat will "break though" pretty suddenly and just get up and be very hungry and want to eat and drink, usually 3-5 days after symptoms appear.
- Closely watch and slowly remove supportive therapies as cat is able to do for him/herself. Feed often during this time period.
- Keep cat isolated for 2.5 to 3 weeks after recovery, bathe coat, and decontaminate environment.

Conclusion

This case report highlights the successful treatment of feline panleukopenia disease in two cats using filgrastim. Filgrastim is a useful adjunct to supportive care in the management of feline panleukopenia, especially in cases of severe leukopenia and neutropenia.

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