



Journal of Applied Veterinary Science and Technology

<http://e-journal.unair.ac.id/javest>



Case Reports

The Treatment of A Case of Feline Panleukopenia Virus in a Mixed Persian Cat

Pengobatan Kasus Feline Panleukopenia Virus pada Kucing Persia Campuran

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ABSTRACT

Background: Feline panleukopenia virus (FPV) is a highly contagious and frequently fatal disease, particularly affecting unvaccinated juvenile cats. Clinical manifestations typically include leukopenia, diarrhea, dehydration, vomiting, and depression. The disease exhibits high morbidity and mortality rates, especially in young animals without prior immunization. **Purpose:** This report aims to provide clinical insight into the diagnosis and symptomatic management of FPV in domestic cats. **Case:** An 8-month-old unvaccinated female cat weighing 2.3 kg was presented with signs consistent with panleukopenia. The patient had not received deworming treatment and lived in a semi-outdoor environment with three other cats. Physical examination focused on the oral cavity, nasal passages, eyes, ears, and abdomen. Hematological findings supported suspicion of viral infection. The history revealed that the patient's littermates had died after exhibiting similar symptoms. **Case Management:** Therapy focused on symptomatic treatment, including the administration of broad-spectrum antibiotics (ceftriaxone) to prevent secondary bacterial infections and reduce the risk of septicemia. Gastric protection was provided using ranitidine to inhibit gastric acid secretion and prevent complications such as ulcers and esophageal erosion. Supportive management also included fluid therapy and antidiarrheal care tailored to the patient's clinical status. **Conclusion:** Prompt diagnosis and appropriate symptomatic management significantly influence the outcome of FPV cases. Preventive strategies, including vaccination and routine deworming, remain essential in reducing the incidence and severity of infection. This case highlights the importance of early intervention and individualized treatment in improving recovery and survival rates in cats affected by panleukopenia.

ARTICLE INFO

Received: 4 September 2024

Revised: 28 March 2025

Accepted: 29 April 2024

Online: 30 April 2025

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Keywords: Cat; Diarrhea; Panleukopenia; Virus

ABSTRAK

Latar Belakang: Feline panleukopenia virus (FPV) merupakan penyakit yang sangat menular dan sering berakibat fatal, terutama pada anak kucing yang belum divaksinasi. Manifestasi klinis umumnya meliputi leukopenia, diare, dehidrasi, muntah, dan depresi. Penyakit ini menunjukkan tingkat morbiditas dan mortalitas yang tinggi, khususnya pada hewan muda tanpa kekebalan sebelumnya. **Tujuan:** Laporan ini bertujuan memberikan wawasan klinis mengenai diagnosis dan penatalaksanaan simptomatik FPV pada kucing domestik. **Kasus:** Seekor kucing betina berumur 8 bulan dengan berat badan 2,3 kg yang belum pernah divaksinasi dan tidak pernah diberikan obat cacing sejak lahir, diperiksa dengan gejala yang mengarah pada panleukopenia. Kucing ini hidup di lingkungan semi-outdoor bersama tiga kucing lain. Pemeriksaan fisik difokuskan pada rongga mulut, hidung, mata, telinga, dan abdomen. Pemeriksaan darah mendukung dugaan infeksi virus. Riwayat menunjukkan bahwa saudara kandung kucing tersebut meninggal dengan gejala serupa. **Penatalaksanaan Kasus:** Terapi difokuskan pada penanganan simptomatik, termasuk pemberian antibiotik spektrum luas (seftriakson) untuk mencegah infeksi bakteri sekunder dan menurunkan risiko sepsis. Proteksi lambung diberikan menggunakan ranitidin untuk menghambat sekresi asam lambung dan mencegah komplikasi seperti tukak lambung dan erosi esofagus. Dukungan terapi juga mencakup pemberian cairan dan penanganan diare yang disesuaikan dengan kondisi klinis pasien. **Kesimpulan:** Diagnosis dini dan penatalaksanaan simptomatik yang tepat sangat memengaruhi prognosis kasus FPV. Strategi pencegahan, termasuk vaksinasi dan pemberian obat cacing secara rutin, sangat penting untuk menurunkan kejadian dan keparahan infeksi. Kasus ini menekankan pentingnya intervensi dini dan terapi individual untuk meningkatkan peluang kesembuhan dan kelangsungan hidup pada kucing yang terinfeksi panleukopenia.

Cite This Article:

Syarifuddin, A., Safitri, J.A., Damhuri, D., Wibowo, S.E., and Triningsih, A., 2025. *The Treatment of A Case of Feline Panleukopenia Virus in a Mixed Persian Cat*. Journal of Applied Veterinary Science and Technology. 6(1): 81-84. <https://doi.org/10.20473/javest.V6.I1.2025.81-84>.

Kata kunci: Diare; Kucing; Panleukopenia; Virus



INTRODUCTION

Cats, being small nocturnal carnivorous mammals belonging to the family of Felidae that have been domesticated for over 4,000 years and predominantly consume meat, are among the most widely chosen household pets due to the manner in which they differ from other domesticated life forms. But, they can be affected by a range of health issues including rabies, fungal infections, otitis, pyometra, flea infestations, and Feline Panleukopenia Virus (FPV) (Kiselev, et al., 2023). Infectious diseases sometimes need a special and effective treatment and follow-up blood tests to recognize and tackle those bacteria (Litster, et al., 2015). For example, FPV is extremely contagious and can cause severe systemic illness in cats and high mortality in young kittens (when untreated). Feline panleukopenia is an extremely contagious viral disease caused by a virus from the Parvoviridae family, called Feline Panleukopenia Virus (FPV), non-enveloped, single-stranded DNA virus with a single antigenic serotype and its environment resistance virus. The disease manifests clinically as leukopenia, vomiting, depression, dehydration and diarrhea (Williams & Jensen, 2023). This virus is extremely deadly, in part, because it can survive for long periods outside its host. It can live for five to 10 months or longer outside and for up to a year at room temperature. Feline Panleukopenia Virus remains a threat for cat populated areas, as the virus is stable in the environment for a long time, leading to high morbidity and mortality rates especially in young and unvaccinated cats. Identically of its severity and fatality canine distemper in dogs, FPV is a virally initiated disease which has deadly effects and is mostly visible in young cats (Pandey, 2022).

The disease is extremely contagious and can spread through direct contact with infected animals or contaminated environments and cannot be easily eradicated as the causative agent can survive in the environment for long periods of time (Thomas & Parker, 2023). Meanwhile, the information about FPV itself is lacking in Indonesia; there are still many things that are not widely spread in the community related to this disease which has not been in accordance with the standard of knowledge of veterinary sciences. Current diagnostic methods are not only limited but also require speed and precision to respond to outbreaks in a timely manner (Awad et al., 2018). While extremely common, this non-zoonotic infectious disease is particularly dangerous due to its acute onset, high mortality, and the susceptibility of kittens and juvenile felines to this virus. In addition, there is still little empirical evidence describing treatment strategies for FPV with zero result-based guidelines or protocols established in Indonesia for its treatment, despite FPV being one of the most communicable and fatal viral infections, specifically among children.

CASE

Anamnesis and Signalment

An unvaccinated 8-month-old female domestic cat named Oci (2.3 kg), living in a semi-outdoor environment with three other cats, presented to the veterinary clinic with no prior referral. Upon arrival, the patient exhibited lethargy, persistent anorexia for two consecutive days, reduced skin

Table 1. General Examination Results of Oci the Cat

Type of Examination	Result	Normal Value*	Description
Temperature (°C)	40	37.7-39.4	High
Capillary refill time (CRT) (seconds)	>2	<2	Slow return
Skin Elasticity/Turgor	>2	<2	Slow return
Mucous Membrane	Pink	Pink	Normal

Note: * Source: Marlissa et al., 2022.

Table 2. The Results of The Blood Chemistry Tests.

Items	Results	Units	References*	Notes
Hemoglobin	14.0	g/dL	9.0-16.7	
Eritrocyte	11.6	10 x 6/mm ³	5.24-10.89	High
Hematocrit	45.7	%	29.2-51.7	
MCV	39.4	fL	29.2-51.7	
MCH	12.0	Pg	41.0-56.2	Low
MCHC	30.6	%	13.0-18.0	
Leukocyte	2.100	10 x 3/mm ³	4.200-17.500	Low
Neutrophil	31.3	%	35-75	Low
Eosinophil	9.0	%	2-12	
Basophil	0	%	0-1	
Limfosit	64.3	%	20-55	High
Monosit	4.4	%	1-4	Low
Trombocyte	0.74	10 x 3/mm ³	180-550	

Note: * Source: Marlissa et al., 2022.



elasticity (indicating dehydration), frothy vomiting, and a rectal temperature of 40°C. These signs were strongly suggestive of a systemic viral infection. Given the high mortality rate associated with feline panleukopenia virus (FPV), further diagnostic procedures were initiated immediately to confirm the suspected diagnosis (Priambudi, et al., 2022). A therapeutic anamnesis-an interview conducted by the attending veterinarian to gather information regarding the patient's at home condition, revealed that Oci had never received any core vaccinations or anthelmintic treatments. The physical examination (Table 1), included evaluation of the oral cavity, nasal area (for moisture level), eyes, ears, and abdominal region through both palpation and auscultation. The patient demonstrated signs of abdominal discomfort, and the overall findings were consistent with viral enteritis. In addition, the case history indicated that one of Oci's littermates had recently died following a similar clinical course. This epidemiological clue, combined with clinical signs and diagnostic findings, led to a strong suspicion of FPV (Taylor and Harris, 2023), which was subsequently confirmed through supporting laboratory tests.

Laboratory Examination

After conducting a routine hematology blood test (Figure 2), additional diagnostic tests were performed using an FPV antigen test kit. The sample used was feces collected from Oci's anus with a sterile cotton bud. After collection, the cotton bud was placed into a diluent solution and thoroughly mixed. The mixed fecal sample was then applied to the rapid test device with 3-5 drops, and the result was awaited for about three minutes.

Diagnosis and Prognosis

An FPV antigen test kit was used to further confirm the diagnosis. This reasoning also assists in understanding the possible course of the disease, enabling early and effective treatment of the infection. The tests led to a definitive conclusion; based on the general test and specific diagnostics, it was concluded that Oci was positive for FPV. The prognosis was dubious because of the highly reduced level of her leukocytes, immune system weaponry. This drastic reduction means that Oci's immune system is badly compromised; she is open to secondary infections, complicating her recovery.

Treatment

According to Pandey, (2022), there is currently no specific antiviral treatment available to treat feline panleukopenia virus infection. This is why most of the treatment deals with the treatment of secondary bacterial infections which commonly appear because of the suppression of the immune system due the virus itself. Also important in improving the cat's chances of survival is symptomatic treatment plus supportive care. Fluid therapy is a central part of supportive care of FPV, as severe vomiting and diarrhea lead to dehydration and electrolyte imbalances (Adams, 2015). Fluid therapy is an essential component in this process, replacing lost body fluids and helping stabilize the cat's condition and prevent further deterioration (Gülersoy, *et al.*, 2023). To prevent and treat the possible secondary bacterial infections that may lead to complications, FPV cases are commonly treated with broad-spectrum antibiotics such as ceftriaxone. Oci's treatment plan also incorporated ceftriaxone, which has shown effectiveness against infections caused by FPV (Pandey, 2022). Oci infected symptomatic treatment plan also included medication like ranitidine, a type of H₂ receptor antagonist. Oci also presented with diarrhea, which needed to be carefully managed to avoid further dehydration and bring her electrolytes back into balance. Enterostop was administered orally to Oci and effectively controlled her diarrhea. Besides treatments for her symptoms, Oci was given supportive care to boost her immune system as she recovered. Oci was given the Dextran-40 and the ATP as part of the care regimen to enhance immune-mediated processes and general recovery. These treatments were critical to her chances of a full recovery.

RESULT

Ten days later, Oci was well enough to switch from inpatient to outpatient care, maintaining stability at home with oral medications. Due to this, the virus can remain viable on different surfaces for more than a year, making it crucial that

the sanitation and environment be part of the FPV infection management process (Pandey, 2022).

DISCUSSION

Clinical signs of fluid loss generally appear only after the body has lost 5% of its total weight in fluids, meaning that dehydration can be undetected until late in the process. In addition, as pointed out by Marlissa, *et al.*, (2022), fever in cats occurs due to thermoregulatory changes triggered by endogenous or exogenous pyrogens entering the body. The body's response to infection involves activating the immune system, with phagocytic cells playing a crucial role in combating viruses such as Feline Panleukopenia. When have an infection, the body will start to activate the immune system to what is typically seen as an intruder, such as the phagocytic cells that are key in taking out feline panleukopenia. Having an immune response generates a setting permitting for fever as protection in direction of pathogen reproduction and to switch up the immune response. According to Marlissa, *et al.*, (2022), panleukopenia cases are associated with marked leukopenia. The decline in white blood cells is a marker of the disease, striking at the heart of the immune system and a key sign of its impaired state. Moreover, the routine hematology examination comprises not only the assessment of white blood cells, but also a detailed understanding of the red blood cell profile including red blood cell count, morphology and overall health. Additional evaluations are conducted to check the levels of platelets and the different parts that are made up of these blood elements, which play a significant role in understanding the clotting ability and blood health of the cat. Routine hematology exam results showed an increase in the red blood cell count (Table 2), and a decrease in mean corpuscular hemoglobin (MCH) values, which may be indicative of potential problems related to hemoglobin concentration in the erythrocytes with its consequent impact on oxygen transport capacity. Moreover, a conspicuous decline in leukocyte (white blood cell) count, especially neutrophils which play an important role in immunity to bacterial infections, were also observed. Platelet count also dropped, raising concern about Oci's ability to effectively clot blood and heal wounds (Garygilyan, *et al.*, 2016). Marlissa, *et al.*, (2022), have recently reported that the decrease of leukocytes, neutrophils, and platelets can be attributed to the disturbance of precursor cells in the bone marrow of cats infected with FPV. This virus selectively infects rapidly dividing cells including, importantly, the marrow and results in a clear suppression of hematopoiesis, the process of generating blood cells. This impairment severely limits the body's capacity to produce leukocytes and platelets in a timely manner, thereby compromising the immune system and increasing the risk of bleeding disorders.

Symptomatic treatment, targeting specific symptoms, is also needed, alongside fluid therapy. In these cases, antibiotic therapy is vital to prevent the exploitable opportunistic bacteria associated with the weakened immune system, as well as septicemia and subsequent severe complications. Marlissa, *et al.*, (2022), add that ranitidine has the mode of function that by working as an antagonist to the action of histamine stomach acid secretion can properly reduce, which is often a

stimulating factor in the case of illness. Because FPV infection leads to stress and illness that make these conditions likely, controlling acid production will help prevent and treat: gastric ulcers, duodenal ulcers, gastroesophageal reflux, and esophageal erosion. Ranitidine acts by decreasing the level of acid in the stomach, thereby helping to relieve the discomfort and prevent additional harm to the gastrointestinal tract (Smith and Johnson, 2023). Diarrhea causes considerable fluid loss in cats, exposing them to the risk of severe dehydration (Brown and Davis, 2024). Active ingredients in Enterostop are attapulgit and pectin. Marlissa, et al., (2022), describe how pectin absorbs surrounding fluids in the intestines, changing stool viscosity and therefore producing denser feces. Marlissa, et al., (2022), based approaches involve supportive measures to assist cats in their immune defenses while they are recovering from FPV infection. The kittens should start receiving vaccinations at two months of age, if they weigh ≥ 1 kg and are healthy, including having been dewormed. One month after the first vaccine, a second dose is given and a third dose is given one more month later. The third vaccination will require annual booster shots. In general, cats start their vaccines at 8 to 10 weeks of age for panleukopenia, feline rhinotracheitis (herpes), calicivirus, and Chlamydia. These vaccines are done every 4-5 weeks until the kitten reaches 20 weeks old, at which point they receive a rabies vaccine that is repeated year for year (Gillespie, et al., 2018).

CONCLUSION

This case illustrates the clinical and hematological manifestations of feline panleukopenia virus (FPV) infection in an unvaccinated juvenile cat. Diagnosis was confirmed through antigen testing. Effective management involved prompt symptomatic and supportive treatment, including antibiotics, fluid therapy, gastric protection, and immune support, resulting in clinical improvement within ten days. This case emphasizes the importance of early diagnosis, comprehensive care, and strict adherence to vaccination protocols to prevent FPV infection and improve outcomes in affected cats.

ACKNOWLEDGEMENT

The authors would like to thank the Department of Animal Health, Faculty of Animal Science, Universitas Jambi who have provided guidance.

CONFLICT of INTEREST

The author declares no conflict of interest in the authorship of

FUNDING INFORMATION

This study received no external funding or financial support. All aspects of this case report, including data collection, analysis, and publication, were conducted independently, and funded by the authors.

ETHICAL APPROVAL

In this Case Study, there is no ethical approval needed.

AUTHORS' CONTRIBUTIONS

Conception and design of the study: AS. Acquisition of data: DD, JAS. Analysis and/or interpretation of data: SEW, AT. Drafting the manuscript: AS. Critical review/revision: DD.

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