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EVALUATION OF DRUG USES FOR CALICIVIRUS AND PANLEUKOPENIA TREATMENT IN BOGOR ANIMAL CLINIC ON 2017 AND 2018

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ABSTRACT

Drug therapy in cases of infections by viruses is only to prevent secondary infections. The use of drugs for each action must be evaluated through a drug use evaluation program (EPO) in order to guarantee a rational and effective drug. This study aims to examine the drugs in case for handling and the effectiveness of drug use in cases of infections caused by viruses, in this study the therapeutic use of drugs in cases of feline calicivirus and feline panleukopenia. This research is a descriptive study using data from 543 patients who came to get treatment of clinic in Bogor City during 2017 and 2018, 29 of which were infected with feline calicivirus and 32 infected with feline panleukopenia. Evaluation of drug use in these two viral diseases is done descriptively by comparing research data with literature. The results showed the use of drugs in the case of feline calicivirus there were 12 types of drug treatment, while in the case of feline panleukopenia there were 9 types of drug treatment. The use of drugs most often used is based on the records of veterinary clinical records, namely the preparation of metronidazole combined with cefadroxil to handle cases of feline calicivirus and metronidazole alone to handle cases of feline panleukopenia.

KEYWORDS

Feline Calicivirus, Feline Panleukopenia, Evaluation Of Drug Use, Metronidazole, Cefadroxyl

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INTRODUCTION

Pets are animals that are domesticated and cared for by owners and can be considered as additional needs for humans (Rahmiati & Pribadi, 2014). The relationship between animals and their owners has been widely studied and proven to provide positive benefits for their owners in terms of physical, psychological and social welfare. This relationship makes pets an increasingly important need in modern households (Chen, Hung, & Peng, 2012). The activity of raising animals is not just a hobby that is not beneficial for animal owners (Nurlayli & Hidayati, 2014), but is a form of social support that can improve health. In general, people are more likely to choose cats as one of their pets, in membership of the World Society for the Protection of Animals (WSPA), the increase in the cat population in Indonesia reached 66% (2nd rank). The world's pet population reaches 15 million cats.

The cats that are kept are mostly domestic cats with the Latin name Felis catus or Felis dometica. Felis domestica is a member of the order Carnivora, family Felidae (Firdaushi, 2015). Cats can be good for humans and can be bad when diseases arise, such as the transmission of cat diseases to humans (Sardjono, Baskoro, Endharti, & Poeranto, 2017). Cat health is very important, this is supported by the role of veterinary hospital clinics to carry out medical actions on pets.

According to Muhammad (2011) states, the cat's habitat will determine the growth and health of cats. Cats are often found in various places such as markets, schools, tourist attractions and terminals so that the growth and health of cats varies. The popularity of pets today makes people more and more fond of keeping pets at home for just a hobby. Many cat owners do not pay attention to good pet care procedures, lack of attention from pet owners can trigger the emergence of diseases in pets that are sometimes considered not serious.

Viral disease is an infectious disease caused by a virus, infection with these agents can occur very quickly and spread to the environment as well as other animals in the vicinity. Viral diseases that can interfere with cat health include feline calicivirus and feline panleukopenia. Feline panleukopenia virus or commonly known as FPV is a disease in cats caused by feline parvovirus, a single-stranded DNA virus. Truyen et al. (2009) stated that the virus is very fatal and risky in cats of all ages and Syafriati (2004) stated that feline panleukopenia can cause death, especially in young cats and reach a mortality rate of 75%. This virus can survive in the environment and remain infectious for up to one month on dry surfaces at room temperature (Truyen et al., 2009).

The prevalence of feline calicivirus or commonly called FCV varies depending on the environment. Individually, FCV is present in about 10% of cats (either in an active state or in carriers), while in shelters or catteries it reaches 25-40%, according to Scherk et al. (2013) stated, this figure is the maximum level of prevalence of calicivirus disease. FCV can spread very quickly, with a mortality rate of up to 67%. Cat owners may not be aware of the early symptoms that indicate that their pet cat has feline calicivirus and feline parvovirus. Cats are usually taken to the vet after the infection is severe or chronic, so the risk of death increases. Cat calici virus can survive in the environment for about 1 month and is resistant to many common disinfectants (Addie et al., 2009) such as phenol, formaldehyde, chlorine, iodine or sublimate (Irianto, 2007).

The purpose of this study was to determine the evaluation of the use of drug preparations in the treatment of cases of feline calicivirus and feline panleukopenia in a

veterinary clinic in Bogor City. While the expected benefits of this study are to provide information regarding the evaluation of the use of drug preparations in the treatment of cases of feline calicivirus and feline panleukopenia in one of the veterinary clinics in Bogor City.

RESEARCH METHOD

This study used a descriptive qualitative method which was carried out from September to October 2019 at the Starvet Animal Clinic, Ciomas, Bogor. The data taken in the form of secondary data, namely medical record data in 2017 and 2018. The tools and materials used in this study are laptops as a tool for processing and inputting data, medical record data for 2017-2018 from one of the Veterinary Clinics in Bogor City, logs book, pen and ruler. The data used in this study were 544 medical record data for the period 2017 to 2018 at the Starvet veterinary clinic in Ciomas, Bogor. The data taken is medical record data suspected of being infected with Calicivirus and Panleukopenia. The data obtained is then stored in tabular form in a log book containing information in the form of signalement, clinical symptoms, diagnoses and drugs. The data obtained from the observations were entered into the Microsoft Excel program. Data analysis used descriptive method. The data were grouped based on the type of disease and the most frequently used drugs for animals infected with feline panleukopenisa and feline calicivirus.

RESULT AND DISCUSSION

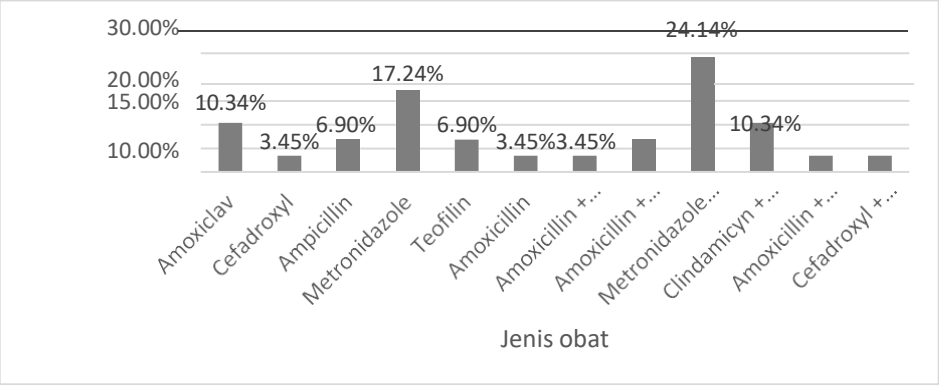
A common problem for cat owners is a viral disease that is known to be fatal in cats, which can lead to rapid death. Diseases that are dangerous for cats include feline calicivirus and feline panleukopenia. Feline calicivirus is often found attacking kittens, sick cats and cats that have not been vaccinated. Kittens are more susceptible to infection than adult cats because maternal antibodies have decreased (Agromedia 2008). Maternal antibody is a part of passive immunity in the body. Passive immunity can be defined as the transfer of active humoral immunity in the form of antibodies from a parent organism to its offspring. Maternal antibodies can enhance immunity by interfering with the growth of pathogenic organisms (Johnson and Povey 1983). The target organs that are attacked by this disease are blood-forming tissue, lymph, and the mucosa of the gastrointestinal organs so that it can cause a decrease in the number of leukocytes and the occurrence of enteritis (Syafriati 2004). The virus will spread for two weeks, after two weeks the infected cat can not release the virus into the environment again or so-called latent infection. This disease usually occurs due to the overcrowded cat population in cages, poor ventilation, poor cage sanitation and poor nutrition.

The results of the examination of 543 patients at the Ciomas Animal Clinic, Bogor based on medical records in 2017 and 2018, obtained 29 positive cats infected with feline calicivirus disease which can be seen in Table 1 and 32 cats positive for feline panleukopenia which can be seen in Table 2. Diseases Feline calicivirus is one of the most common viral diseases, based on the results of medical records in 2017 and 2018 at the veterinary clinic as presented in Table 1.

Table 1 Use of drug therapy in cases of calicivirus

Drug Use	Type of Drug	Number of Uses	Percentage
Alone	Amoxiclav®	3	10.34%
	Sefadroksil	1	3.45%
	Ampisillin	2	6.90%
	Metronidazol	5	17.24%
	Teofilin	2	6.90%
	Amoksisillin	1	3.45%
Combination 2 drug	Amoksisillin + Deksametason	1	3.45%
	Amoksisillin + Metronidazol	2	6.90%
	Metronidazol + Sefadroksil	7	24.14%
	Klindamisin + Metronidazol	3	10.34%
Combination 3 drug	Amoksisillin + Metronidazol + Teofilin	1	3.45%
	Sefadroksil + Fluimicyl® + Bromheksin	1	3.45%
	Total	**29**	

The number of feline calicivirus cases in the span of two years is 29 cases. Feline calicivirus is spread throughout the world and can attack all cat breeds. According to Radford (2007), this disease attacks cats with high levels of infection and transmission from infected cats to healthy cats. The prevalence of calicivirus in animal shelters can range from 25-40%. Drug therapy used in the veterinary clinic in handling this case included 10.34% amoxiclav®, 3.45% cefadroxil, 6.90% ampicillin, 17.24% metronidazole, 6.90% theophylline, 3.45% amoxicillin, 3.45% amoxicillin combined with dexamethasone. , amoxicillin and metronidazole 6.90%, metronidazole and cefadroxil 24.14%, clindamycin and metronidazole 10.34%, amoxicillin combined with metronidazole and theophylline 3.45% and cefadroxil combined fluimicyl® with bromhexine. The graph of the use of antifungal drugs in the research object's clinic in a span of two years can be seen in Graph 1.



Graph 1 The use of drug therapy in cases of feline calicivirus in one of the veterinary clinics in Bogor City

Based on medical records at the veterinary clinic, the most widely used drug therapy for cases of feline calicivirus was metronidazole combined with cefadroxil, which was

24.14% of the 12 types of treatment therapy. According to Radford (2009), the calici virus specifically will cause disorders in the oral area such as stomatitis or gingivitis as well as the respiratory system. According to Radford et al. (2009) stated, calicivirus in cats can be isolated from almost all cats with chronic stomatitis or gingivitis. Gondo (2007) states that the use of antibiotics in combination has several advantages such as reducing resistance to antibiotics because the use of synergistic combinations of antibiotics can increase the ability of antibiotics to kill germs, besides the use of antibiotics in combination can reduce the toxic effects of drugs due to the lower dose of each type of antibiotic used given the lower the toxicity.

The combination of metronidazole with beta-lactam antibiotics such as cefadroxil is indicated for acute inflammation in cases of gingivitis (Gondo 2007), this is in accordance with Radford et al. (2009) which states, in the case of feline calicivirus, disturbances in the oral area in the form of gingivitis occur. According to Eloufir et al. (2014) explained that metronidazole can kill Entamoeba gingivalis in the mouth which is the cause of gingivitis. Metronidazole is an antibiotic that works by interfering with DNA and nucleic acid synthesis in microorganisms (Plumb 2011). This preparation is also commonly used to prevent infection by anaerobic bacteria and can be the first choice to treat Helicobacter pylori infection (Sipahigil et al. 2011). This preparation can also prevent infection with anaerobic gram-positive bacteria such as Clostridium tetani and Clostridium botulinum and also anaerobic gram-negative bacteria such as Bacterioides and Fusobacterium. Metronidazole in addition to working as an antibacterial, is also useful as an antiprotozoa that causes inflammation in the oral area. This drug is widely used to treat giardiasis in cats as well as to treat other parasites such as Trichomonas, Entamoeba histolytica and Balantidium coli (Plumb 2011). The use of metronidazole should be limited to patients who have liver disorders because this antibiotic is one of the antibiotics that is metabolized in the liver and is eliminated in the bile (Suardi 2014). According to (Nurlaela 2018) explained, metronidazole has a half-life of 7.5 hours and has a protein binding of 10-20%.

Cefadroxil is a first generation cephalosporin antibiotic that has broad bactericidal activity by inhibiting cell wall synthesis and is long acting. This drug has broad activity against gram-positive and negative bacteria, has high stability against -lactamases in bacteria (Sweetman 2009). According to Plumb (2011) explained that cefadroxil can be given along with food, especially for animals suffering from gastrointestinal disorders. Cefadroxil also has almost complete enteral absorption (Schmitz et al. 2009). Another viral disease that is most often found in the clinic is feline panleukopenia, as can be seen in Table 2. Feline panleukopenia virus is an acute infectious disease characterized by fever, diarrhea and dehydration in cats. This virus belongs to the parvoviridae family of DNA viruses (Gur and Avdatek 2016).

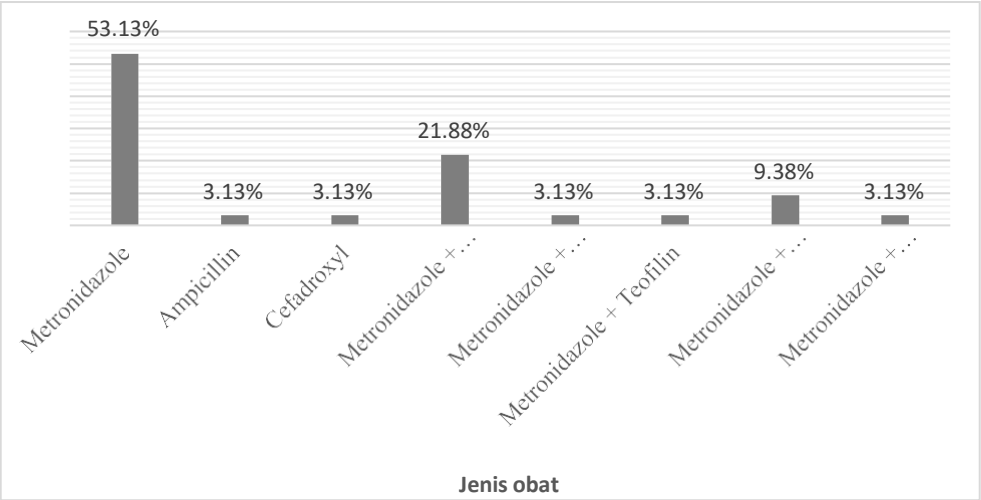
Table 2 Use of drug therapy in cases of feline panleukopenia

Drug Use	Type of Drug	Number of Uses	Percentage (%)
Single	Metronidazol	17	53.13%
	Ampisillin	1	3.13%
	Sefadroksil	1	3.13%
Combination 2	Metronidazol+ Ampisillin	7	21.88%
	Metronidazol+ Amoksisillin	1	3.13%
	Metronidazol+ Teofilin	1	3.13%
	Metronidazol+ Sefadroksil	3	9.38%
Combination 3	Metronidazol+ Klindamisin + Metilprednil	1	3.13%
	Total	32	

Panleukopeia virus is a single-stranded DNA virus that is not encapsulated, resistant to some common disinfectants such as phenol, formaldehyde, chlorine, iodine or sublimate and has the ability to replicate very quickly. These agents replicate in oropharyngeal lymphoid tissue and can enter through the mouth or nose to the tonsils and lymph nodes. This virus will suppress the production of white blood cells in the bone marrow so that white blood cells circulating in the body are reduced. The activity of this virus in the intestine can cause ulcers that result in bloody diarrhea, dehydration and infection by bacteria. Death will occur when dehydration and bacterial infection are severe (Mosallanejad, Avizeh, & Ghorbanpoor Najafabadi, 2009).

Feline panleukopenia is characterized by typical early symptoms, namely fever, depression and anorexia. Cats may initially vomit with a lower frequency, develop watery diarrhea to hemorrhagic. Cats that die from this disease can be caused by complications from secondary bacterial infection, sepsis, dehydration and disseminated intravascular coagulopathy (DIC). The mortality rate in cases of feline panleukopenia reaches 25-90% in acute cases, while 100% in acute infections (Carney et al., 2012). Transfer of disease can occur directly or indirectly. Feline panleukopenia attacks directly on young cats who have low immunity, while indirect infection can be through the urine and feces of infected animals (Horzinek et al., 2013).

Drug therapy used in this clinic in cases of feline panleukopenia include 53.13% metronidazole, 3.13% ampicillin, 3.13% cefadroxil, 21.88% metronidazole combined with ampicillin, 3.13% metronidazole with amoxicillin, 3.13% metronidazole with theophylline, metronidazole with cefadroxil 9.38% and metronidazole combined with clindamycin with methylprednyl as much as 3.13%. Based on medical records at the veterinary clinic, the most widely used drug therapy for cases of feline panleukopenia was metronidazole, which was 53.13% of the 8 types of treatment therapy. The graph of the use of feline panleukopenia drugs in the research object clinic in a span of two years can be seen in Graph 2.



Graph 2 Use of drug therapy in cases of feline panleukopenia in a veterinary clinic in Bogor City

Metronidazole is the most widely used drug preparation in the treatment of feline panleukopenia in the veterinary clinic, this is in accordance with the literature of Sherlin et

al.(2018), in the treatment of feline panleukopenia cases, metronidazole antibiotics were used successfully marked by the cat's condition that significantly improved. Tamiflu® protects the intestines and can provide extra protection against bacteremia caused by this virus. According to Rice (2017) explained that as an alternative to the Tamiflu® drug, metronidazole can be used. In addition, Metronidazole works by intervening in the synthesis of RNA or DNA from microorganisms (Schmitz, Lepper, & Heidrich, 2009).

Metronidazole can also be used to treat secondary infections caused by anaerobic microorganisms, both bacteria and protozoa. Metronidazole is also widely used to treat giardiasis in cats as well as to treat other parasites such as Trichomonas, Entamoeba histolytica and Balantidium coli. This drug works by interfering with the synthesis of DNA and nucleic acids in bacteria (Gallagher, Setakis, Plumb, Clemens, & van Staa, 2011). Metronidazole works as a therapy for anaerobic bacterial infections, trichomoniasis, amebiasis, intestinal infections caused by giardia. Metronidazole has an oral bioavailability of more than 90%, including high rates where bioavailability is the time it takes for a drug to have a therapeutic effect and how much of the drug can be absorbed by the body, thus determining the therapeutic effectiveness of the drug (Bamigbola, Ibrahim, Attama, & Arute, 2009).

Metronidazole Metronidazole is a bactericidal agent whose use is dose dependent. This preparation also has activity against most obligate anaerobic bacteria such as Bactericoides spp., Fusobacterium, Veillonella, Clostridium spp., Peplococcus and Peptostreptococcus. Metronidazole also acts as a direct trichomonaside and amoebicide.

CONCLUSION

The most widely used drug for feline calicivirus disease is metronidazole combined with cefadroxil, while metronidazole is used in the treatment of feline panleukopenia because this drug has been shown to be effective in treating secondary infections in feline calicivirus and feline panleukopenia cases. This study can be used as a reference for further research and evaluate more drugs in cases of feline calicivirus and feline panleukopenia. There can be more cases discussed, the range of years used can also be longer, and the clinical object of research can be added so that there is a real comparison to see the effectiveness of the drug.

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