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The Incidence of Parvovirus that Causes *Feline Panleukopenia* on Stray Cats (*Felis catus*) with the FPV Rapid Test Kit Ag in the East Surabaya Indonesia

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ABSTRACT

Feline Panleukopenia (FP) is highly infectious disease for felidae kingdom but has not been found in human. FP is caused by feline panleukopenia virus (FPV) from the parvoviridae family. FPV has a very high mortality and morbidity rates. symptoms from this disease is a high fever, appetite loss, vomit which occur from the high fever, and hypersalivation. Most cases for FPV is happen on stray cat. The growing population of the stray cat can increase the risk of the FPV. The aim for this study is to find the potential of the feline panleukopenia virus spread on the stray cat from east Surabaya using the FPV rapid test kit ag and the swab sample from the cat anus. The results showed that there was one adult male cat with an incidence percentage of 0.03% which detected the presence of FPV antigen.

Keywords: Feline panleukopenia Virus (FPV); stray cats; rapid test kit FPV Ag

INTRODUCTION

Feline panleukopenia (FP) is a highly contagious infectious disease in the felidae family and has not been found in humans¹. FP is caused by Feline panleukopenia virus (FPV) of the parvoviridae family. FPV have a very high mortality and morbidityrate². Symptoms that FPV can cause is high fever, decreased appetite, vomiting usually occurs after high fever and sometimes hypersalivation³. FPV also has subclinical symptoms that means that the cat does not show a certain symptom or a mild form of medical condition⁴. This subclinical case, occurs a lot in adult cats⁵. This can happen because the cat has been infected with FPV and then recovered or have been vaccinated, which makes the cat stronger against attacks from FPV. However, this does not rule out the possibility of a cat with Subclinical symptoms to transmit this disease to other cats⁶. On subclinical stage, prevention efforts are needed so that there is no secondary infection that makes the cat infected with FPV condition worse⁷.

FPV cases are more frequent in stray cats, Islamet al⁸ said that the prevalence of FPV in stray cats (41.67%) is higher compared to a house cat (17.39%). This can happen because stray cats did not get animal welfare, such as a place to live^{9, 10} deworming vitamin, food and also vaccine. In addition, stray cats have wider roaming range compared to a pet cat according to Meek¹¹ stray cats roaming area is up to 5.1 Ha while house cat only 2.9 Ha, this wider roam territory can also to be one of the factors that causes more stray cats is at risk of developing FPV.

Population of stray cat keep increaseing because cat is an animal that is seasonally polyestrous¹² it means cat have seasonal estrous and are able to concieve several times a year with each birth has approximately 3 kittens. The increase of stray cat population will pose more risk to FPV.

It is needed to perform FPV detection on stray cats in East Surabaya in order to determine the potential for FPV cases on stray cats and can preventt FPV.

METHODS

The sample in this study is stray cat anal swab that was in East Surabaya area. A total of 30 stray cats anal swab samples from 3 markets in East Surabaya including the Sopoyono market, Rungkut sub-district, Pucang market, Gubeng sub-district, and Semolowaru market, Sukolilo sub-district that has a high stray cat population, 10 samples were taken from each market. Sampling method in this research is accidental sampling. The material used is stray cat's anal swab found by the researchers in field. The liquid diluent contains approximately 3 ml in the *Rapid Test FPV kits ag* package. Cat food to make the cat approaches without any coercion which can make cats tormented. The tools used are glove, paper or newspaper, masks and *RapidFPV Test Kits ag. Rapid Test Kit FPV ag* is a tool to test the presence of FPV antigen on the feces from stray cat's anal swab found by the researchers.

The cats were caught and approached using cat food, the cat was positioned comfortably then sampling can be conducted. Samples were taken from the cat anal using cotton bud, then entered into the collection tube which contains approx. 3 ml of diluent, then stirred slowly. The The supernatant was taken using a pipette from the *Rapid Test FPV kits ag* package then add about 3-4 drops into the round hole in the *rapid test kit FPV ag. Rapid Test Kit FPV ag* was positioned in a flat and dry surface. The interpretation of the results will appear in approximately 5-10 minutes. Negative result is shown if there is only 1 line on the letter C which means control. Positive result is shown if there are 2 lines on the letter C, the result invalid⁸, and it needs to be repeated using the same sample¹³.

After taking a sample, a section of fur on the back near the tail or sacrum of the cat was cut to differentiate the cats.

RESULTS AND DISCUSSION

TABLE 1: Results of Parvovirus Incidence in stray Cats at

 Sopoyono Market, Rungkut District

Cat Group	Amount	Negative Results	Positive Results
Male Kitten	4	4	0
Adult Male	1	1	0
Female Kitten	1	1	0
Adult Female	4	4	0
Amount	10	10	0

TABLE 2: Results of Parvovirus Incidence in stray Cats at
Pucang Market, Gubeng District.

Cat Group	Amount	Negative Results	Positive Results
Male Kitten	1	1	0
Adult Male	3	3	0
Female Kitten	2	2	0
Adult Female	4	4	0
Amount	10	10	0

TABLE 3: Results of Parvovirus Incidence in stray Cats at
Semolowaru Market, Sukolilo District.

Cat Group	Amount	Negative Results	Positive Results
Male Kitten	1	1	0
Adult Male	3	2	1
Female Kitten	2	2	0
Adult Female	4	4	0
Amount	10	9	1

In the descriptive table above, it can be seen that there are 30 stray cat's anal swab samples and showed 29 negative samples and there was one positive number from the Semolowaru, Sukolilo District. From these results, it appears that two lines are formed on the C line and the T line.



FIGURE 1: Positive Result



FIGURE 2: Negative Result

From the results of these data, it can be seen the percentage of parvovirus events that causes Feline panleukopenia on stray cats in the East Surabaya Region is 0.03%. This percentagee was based on the formula:

Event percentage

= (Σ positive samples)/(Σ all samples) × 100%

 $= 1/30 \times 100\%$

= 0,03%

RESULTS AND DISCUSSION

The results of the research on the incidence of parvovirus that causes FP in stray cats seems to show positive results in adult male cats. In the research of Bukar-kolo et al¹⁴ the prevalence of FPV positive male cats 7% and 6.5% female cat. FPV incident in male cats is higher probably due to the wider roaming area than the female cat which made the males are more at risk of getting infected with FPV. According to Hansen¹⁵ male cats has a 2 times wider home range than female cats. Beside the gender, there is the location factor. The market is damp and also dirty which is the source of disease infection¹⁶ with no exception of FPV in stray cats that lives on the market.

In the research results, there are 2 lines on the Rapid Test Kit FPV ag with a line at the C mark, which means Control and T which means Test. This shows there are positive results but the T line looks faint and not as clear as on line C. The adult male cat showed clinical symptoms that leads the cat to be infected with FPV. The cat has a fever but no diarrhea which according to Squires³ diarrhea occurs after one to two days of FPV infection, it is possible that the antibody titer to FPV is still low or under cut off¹⁷ which causes faint lines to form. Detection limit of the Rapid Test Kit FPV ag is approximately $10^{4.5}$ TCID₅₀/0.1 ml¹⁸.

The percentage of results shows 0.03% which is a very small number. The possibility of this happening is because of the climate when the study was conducted. Hafid¹⁹ said that FPV infection is higher during the rainy season. According to BMKG²⁰ in March on East Surabaya is the end of the rainy season and categorized as normal. Another possibility is the low survival rate because FPV is a disease with high mortality rate to $100\%^{21}$. Untreated adult cat mortality rate reaches 85% and mortality in untreated kitten reaches $100\%^{22}$. FPV-infected cats are most likely died before sampled.

The results of this study are different with research conducted by Mahendra²³. Compared to the previous research, which the data was collected from medical records at the veterinary clinic and a veterinary hospital. It is possible that cats infected with FPV are housecats which their health, environmental conditions and temperature are always monitored. This research method is only done at one time and using stray cats that the health, condition and temperature is unknown. So, when doing this research, it is very difficult to find a stray cat that is infected with FPV, with high mortality and without treatment and therapy.

The main prevention that can be done is vaccination of cats, even if the vaccination cannot completely guarantee the cat won't be infected but at least the cat will be stronger against FPV infection²⁴. The first vaccination can be done from the age of 8-9 weeks²⁵.

CONCLUSION

Based on research results regarding the incidence of parvovirus instray cats in some market at East Surabaya using Rapid Test Kit FPV ag in March to April 2022, it can be concluded that there is one adult male cat with percentage 0.03% incidence detected FP virus.

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