

Risk Factors Predisposing Feline Parvovirus Infection in Feline Population of Chennai

Xavier Mathew^{1*}, M. Ashokkumar², P. Azhahianambi³, A. Ramesh⁴, and N. R Senthil⁵

Department of Veterinary Preventive Medicine, Madras Veterinary college, Vepery, Chennai 600007, India

(Received : September, 2023 189/23 Accepted : January, 2024)

Abstract

The study analyzed the risk factors predisposing to feline parvovirus (FPV) infection in Chennai. A total of 250 feline faecal DNA samples were screened for FPV with TaqMan RT-qPCR. Risk factors such as temporal distribution, age, sex, breed, type of food, source of drinking water, and contact with stray cats were analyzed using a structured questionnaire. An overall case prevalence of 75.83% was observed in Chennai from January 2022 to May 2023. Risk factors such as period after rainy season, age below six months, nutritionally imbalanced diet, contaminated water sources such as drainage water which is accessible for stray cats and contact with stray cats were found to be the predisposing risk factors of FPV infection.

Key words: FPV, TaqMan Real-Time qPCR, Risk factors.

Feline Parvovirus (FPV), also known as feline panleukopenia virus, is a highly contagious and potentially deadly viral pathogen that primarily affects domestic cats and other members of the Felidae family, which causes haemorrhagic gastroenteritis in felines.

Chennai, the vibrant metropolis nestled along the southeastern coast of India, is home to a diverse and sizable feline population. As with any densely populated area, the risk of infectious diseases among cats is a significant concern for veterinarians and pet owners. This research delves into the potential risk factors for FPV infection in Chennai. By analyzing data collected through structured questionnaire and molecular diagnostics, the present study seeks to identify key variables that increase the susceptibility of cats to FPV.

Materials and Methods

A total of 250 feline cases presented to the Small Animal Out-Patient unit of Madras Veterinary College Teaching Hospital, Chennai, Veterinary University Peripheral Hospital, Madhavaram, and private veterinary hospitals in Chennai were selected for this study. Faecal swabs were utilized as the primary method for sample collection. To investigate potential risk factors associated with FPV infection, structured questionnaires were administered to pet parents. The following risk factors were assessed: temporal distribution (January 2022 to May 2023), age, sex, breed, type of food, source of drinking water and contact with stray cats by student t-test (Microsoft® Excel® for Microsoft 365 MSO (Version 2308 Build 16.0.16731.20182) 64-bit). DNA was extracted from all the 250 samples using Phenol Chloroform Isoamyl alcohol (25:24:1) (Green and Sambrook, 2017). After DNA extraction, all the samples were subjected to TaqMan RT-qPCR for genomic detection of VP2 gene of FPV. Primers and probe sequences were adopted from Cao *et al.* (2022).

*Corresponding author : Email : drxaviervet@gmail.com

¹Ph. D Scholar, Dept. of Veterinary Preventive Medicine, Madras Veterinary college, Vepery, Chennai, India, PIN: 600007

²Assistant Professor, Dept. of Veterinary Public Health and Epidemiology, Madras Veterinary College, Chennai, India, PIN: 600007

³Assistant Professor, Translational Research Platform for Veterinary Biologicals, Centre for Animal Health Studies, TANUVAS, Chennai, India, PIN: 600007

⁴Professor, Dept. of Veterinary Microbiology, Madras Veterinary College, Chennai, India, PIN: 600007

⁵Assistant Professor, Centralized Clinical Laboratory, Madras Veterinary College, Chennai, India, PIN: 600007.

Results and Discussions

A total of 182 feline faecal samples found positive for FPV VP2 gene fragment out of 250 samples, with a prevalence rate of 75.83 % in Chennai (Blaker CL). The result of melting curve analysis is shown in Fig 1, Fig 2 and Fig 3.

The temporal distribution of FPV indicates a significant decrease in test positivity rate (TPR) from June 2022 to November 2022 (rainy weather), compared to December 2022 to May 2023 (dry weather)($p=0.001$). This finding contradicts the results of Al Eissae *et al.* (2020), who reported an increased TPR of FPV during wet and cold weather conditions. The divergence between our study and Al Eissae *et al. loc cit* research necessitates careful examination on other risk factors such as stray cat population, virus resistance to environment conditions and vaccine affordability of pet parents. Discrepancies in geographical locations, seasonal polyestrus associated influx of large number of young kittens to the population during summer to autumn (Barrs, 2019) and climatic conditions between the two studies may have had a significant impact on the observed difference. It is possible that the climate in our study area during the respective time periods had distinct characteristics such as environmental humidity, temperature, wind etc. compared to those investigated by Al Eissae *et al. loc cit*. Additionally, differences in study populations, sample sizes, or data collection methodologies may explain the disparities observed in our findings.

It was found that younger age, especially below six months, significantly influences the infection of FPV with a TPR of 85.58 % ($p = 0.015$). The results are in agreement with the findings of Stuetzer and Hartmann. (2014), as the FPV has a higher affinity to rapid-growing cells during the S-Phase of viral replication.

There was a significant relationship noticed between TPR of FPV and possible contact with social stray cats ($p=0.029$). Cats which had social contact with stray cats showed higher TPR (74.35 %) of FPV in comparison with cats which had restricted access to stray animals (67.8 %), which is in agreement with the findings of Kiparand Meli. (2014) who observed prevalence rate more than 90 % in multi-cat environments including both catteries and free-roaming stray cats.

Sex ($p= 0.129$) and breed (p value= 0.051) doesn't influence the TPR of FPV., which is consistent with the findings of Abdel-Baky *et al.* (2022) and Abdel-Baky *et al.* (2023) respectively. According to Abdel-Baky *et al.* (2022) and Abdel-Baky *et al.* (2023), sex and breed do not affect the TPR of FPV. This is consistent with our findings, which showed no significant difference in TPR based on sex ($p = 0.129$) or breed ($p = 0.051$).

Significant influence was noticed between food quality and TPR of FPV ($p= 0.045$). Stray cat population had highest TPR (84.56%) followed by home-made food fed cats (63.77%) and commercial pet food fed cats (37.5%).

The significant influence was observed between drinking water and TPR of FPV ($p= 0.014$), where stray cat population had highest TPR (84.56%), followed by corporation water drinking cats (69.05%), borewell water drinking cats (66.67%) and household purified (RO water) drinking cats (28.13%).

In conclusion, period after rainy season, age below six months, imbalanced diet, contaminated water and contact with stray cats are the most predisposing factors of FPV in Chennai. As per the evaluation of results, breed and gender of cats have no role in FPV infections.

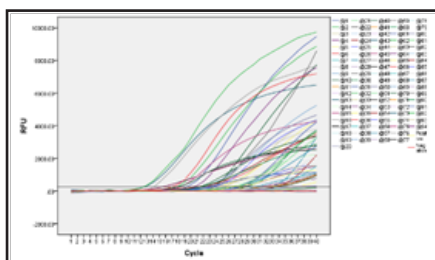


Fig 1

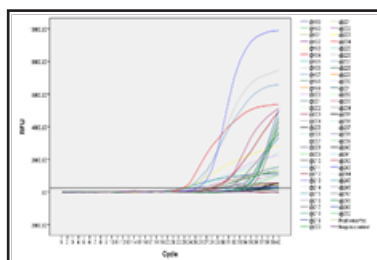


Fig 2

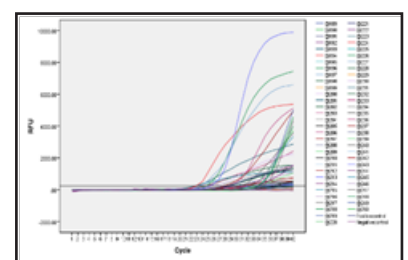


Fig 3

Summary

To identify the risk variables contributing to FPV infection in Chennai, research was carried out. Using TaqMan RT-qPCR, 250 samples of feline faeces DNA were examined for FPV. A structured questionnaire was used to analyze risk variables such as temporal distribution, age, sex, breed, type of food, type of water, and interaction with stray cats. Chennai saw a 75.83% total case prevalence from January 2022 to May 2023. The biggest risk factors for FPV are the time following the rainy season, age under six months, imbalanced nutrition, contaminated drinking water, and interaction with feral cats.

References

Abdel-Baky, M. M., El-Khabaz, K. A., and Hamed, M. I. (2022). Rapid One-Step Test for detection of Feline and Canine Parvoviruses in Cats. *J. Adv. Vet. Res.* **12**(2) : 148-152.

Abdel-Baky, M. M., El-Khabaz, K. A., Abdelbaset, A. E., and Hamed, M. I. (2023). Clinico-epidemiological survey of feline parvovirus circulating in three Egyptian provinces from 2020 to 2021. *Arch. Virol.* **168**(4) : 126.

Al Eissae, S. A., Mohteshamuddin, K., Mahel, Z., and Ameni, G. (2020). Retrospective longitudinal study on canine and feline parvovirus infections in Al Ain, United Arab Emirates. *Emir. J. Food. Agric.* **32**(11) : 762-767.

Barrs, V.R., (2019). Feline panleukopenia: a re-emergent disease. *Vet. Clin. Small Anim. Pract.*, **49**(4) : 651-670.

Cao, N., Tang, Z., Zhang, X., Li, W., Li, B., Tian, Y., and Xu, D. (2022). Development and application of a Triplex TaqMan quantitative real-time PCR assay for simultaneous detection of Feline Calicivirus, Feline Parvovirus, and Feline Herpesvirus 1. *Front. Vet. Sci.* **8**: 792322.

Kipar, A., and Meli, M. L. (2014). Feline infectious peritonitis: still an enigma?. *Vet. Pathol.* **51**(2) : 505-526.

Stuetzer, B., and Hartmann, K. (2014). Feline parvovirus infection and associated diseases. *Vet. J.* **201**(2) : 150-155.

Indian Vet. J., January 2024, 101 (1) : 24 - 27

Reproductive Toxicity Induced by 5-Fluorouracil (5-FU) and the Potential Ameliorative Effects of Naringenin -28 Days Experimental Study in Wistar Rats

Sravathi Vemula¹, Jeevanalatha Mylaram^{2*}, Swathi Bora³, Nagarjuna Gandham⁴, Mounika Kamishetti⁵, Durga Veera Hanuman Donga⁶, and Bhaskar Debbarma⁷

College of Veterinary Science, Rajendranagar, Hyderabad, Telangana, India

(Received : September, 2023 **180/23** Accepted : January, 2024)

Abstract

This study evaluates the potential ameliorative effects of Naringenin (NG) on testicular

function in a 5-Fluorouracil (5-FU) induced testicular toxicity model. Male rats were divided into control, 5-FU treated, NG treated and NG + 5-FU combination groups with 6 animals each. Hormonal assays revealed a significant decrease in 5-FU treated group. Furthermore, pro-inflammatory cytokines (TNF- α , IL-1 β , IL-6) exhibited a marked increase in the 5-FU group, which was significantly attenuated by decrease pro-inflammatory levels in NG + 5-FU combination group. Anti-inflammatory cytokine (IL-10) levels significantly decreased in 5-FU group but were notably restored with NG treatment along with hormone levels by mitigating chemotherapy-induced testicular damage.

¹Ph.D Scholar, Department of Veterinary Pathology, Email: sravanthiraghu38@gmail.com

²Associate Professor & Head, Department of Veterinary Pathology, College of Veterinary Science, Mamnoon-Warangal, Telangana, India Email: drjeevanalatha@gmail.com

³Assistant Professor, Department of Veterinary Pathology, Email: rkk.swathi@gmail.com

⁴MVSc Scholar, Department of Veterinary Pharmacology and Toxicology, Email: nagarjunagandham94@gmail.com

⁵Department of Veterinary Pharmacology and Toxicology, Email: mounikakamishetti45@gmail.com

⁶Ph.D Scholar, Department of Veterinary Pharmacology and Toxicology, Email: handy.hanu@gmail.com

⁷Ph.D Scholar, Department of Veterinary Pharmacology and Toxicology, Email: bhaskardebbarma2019@gmail.com