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Detection and Epidemiology of canine parvovirus infection in dogs

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Abstract

A total of 335 dogs suspected of Canine Parvovirus (CPV) infection presented during the nine-month study period were clinically evaluated and tested by Polymerase Chain Reaction (PCR). Of these, 232 samples (69.25%) tested positive for CPV. The highest incidence was observed in dogs aged 3-6 months (38.79%), followed by < 3 months (25.43%), 6-9 months (24.14%), and > 9 months (11.64%). Males showed higher prevalence (73.28%) than females (26.72%). Non-descript dogs were most affected (58.19%), and winter recorded the highest seasonal prevalence (46.12%). A greater incidence was noted in non-vaccinated dogs (66.38%), with the highest and lowest monthly occurrence in February (27.15%) and May (3.88%), respectively. The findings provide important epidemiological insights into CPV infection.

Keywords: Canine parvovirus, epidemiology, polymerase chain reaction, rapid antigen test, dogs

1. Introduction

Canine parvoviral enteritis (CPVE) is a globally prevalent, highly contagious, and potentially fatal disease of dogs caused predominantly by canine parvovirus type 2 (CPV-2), characterized by severe gastroenteritis and occasional myocarditis (Nandi *et al.*, 2019; Zhou, *et al.*, 2024) [18, 25]. Canine parvo virus primarily targets the rapidly dividing epithelial cells of the intestinal crypts of Lieberkühn, leading to villous atrophy and severe gastrointestinal damage (Nandi & Kumar, 2010; Sykes, 2014) [17, 24]. Canine parvovirus is predominantly transmitted among dogs *via* the fecal-oral route. The prevalence of canine parvoviral infection ranges from 6.93% to 65.04%, depending on geographic location, population density, vaccine coverage and hygiene status (Khare *et al.*, 2019) [11].

Young puppies exhibit a higher prevalence of canine parvovirus infection compared to adult dogs (Behera *et al.*, 2015; Albaz *et al.*, 2015; Khare *et al.*, 2019) [4, 3, 11]. All dog breeds are susceptible to infection; however, non-descript breeds and certain breed of dogs, such as Labrador Retrievers and German Shepherds, exhibit higher susceptibility to canine parvovirus (CPV), (Ling *et al.*, 2012; Behera *et al.*, 2015) [12, 4]. Dogs that are unvaccinated, or whose vaccination history is irregular or unknown, have a significantly elevated risk of developing the disease compared to dogs that are completely and regularly vaccinated (Godsall *et al.*, 2010; Ling *et al.*, 2012) [8, 12]. Unvaccinated puppies can have a death rate of up to 91%.

Despite widespread vaccination, canine parvovirus (CPV) continues to cause significant disease and mortality in puppies because of immunization failures due to varied factors. Hence, this study was conducted to determine the epidemiology of CPV in the study region, Banaskantha.

2. Materials and Methods

A total of 335 dogs presented with diarrhea and vomiting to the Veterinary Clinical Complex, Sardarkrushinagar and Deesa were screened for canine parvoviral enteritis (CPVE). The study was conducted over a nine-month period from January to September 2025. A total of 335 dogs suspected of Canine Parvovirus (CPV) infection were tested using polymerase chain reaction (PCR), and the overall prevalence was determined based on PCR results.

For each dog, detailed clinical history, thorough physical examination, and relevant epidemiological information were recorded.

Faecal samples (approximately 1 g) were aseptically collected per rectum using sterile HiCulture swabs and transferred into sterile screw-cap collection tubes. A faecal suspension (10% w/v) was prepared by homogenizing the sample in sterile phosphate-buffered saline (4 ml PBS, pH 7.2). The swab along with the faecal suspension was placed in sterile 2 mL tubes and stored at -20 °C until further processing for polymerase chain reaction (PCR).

Genomic DNA of canine parvovirus type-2 (CPV-2) was extracted from faecal samples using the heat extraction method. PCR amplification of the VP2 gene was performed using primers CPV555FP (5'-CAGGAAGATATCCAGAAGGA-3') and CPV555RP (5'-GGTGCTAGTTGATATGTAATAACA-3'), which amplify a 583 bp fragment (Buonavoglia *et al.*, 2001) [5].

2.1 Statistical Analysis

The data on different variables included in the present study were analysed by using the SPSS software package (version 20). Categorical data on the occurrence/positivity of the disease was analysed by Chi-square test for goodness-of-fit or independence as per the case.

3. Results and Discussion

A total of 335 dogs suspected of canine parvovirus (CPV) infection were tested using polymerase chain reaction (PCR). CPV was detected in 232 samples (69.25%), highlighting the high diagnostic sensitivity of PCR. This finding is consistent with Chauhan *et al.* (2024) and is likely due to PCR's ability to detect low viral loads.

Gender-wise analysis showed a significantly higher prevalence ($p \leq 0.05$) in male dogs (73.28%; 170/232) than in female dogs (26.72%; 62/232), (Table 1). Similar male predominance has been widely reported, Behera *et al.*, 2015 [4]; Rafiq *et al.*, 2019 [21]; Kalita *et al.*, 2022 [10]; Abdalla *et al.*, 2023 [1]; Panchasheel *et al.*, 2024 [19]; Mohan *et al.*, 2025 [16]. Increased roaming behaviour, greater environmental exposure, and preferential ownership of male dogs may contribute to this difference (Reddy *et al.*, 2015; Deka *et al.*, 2013) [23, 7]. Age-wise distribution indicated the highest susceptibility in dogs aged 3-6 months (38.79%), followed by

< 3 months (25.43%), 6-9 months (24.14%), and > 9 months (11.64%) (Table 2). These results corroborate earlier findings showing increased CPV incidence in puppies younger than 6 months, Rafiq *et al.*, 2019 [21]; Kalita *et al.*, 2022 [10]; Minnat and Sadiq, 2023 [15]. Increased susceptibility in this age group may be due to viral tropism for rapidly dividing cells, declining maternally derived antibodies, and interference with vaccine-induced immunity during early life (Rashid *et al.*, 2009 [22]; Deka *et al.*, 2013) [7]. Breed-wise analysis revealed the highest proportion of CPV-positive cases in non-descript dogs (58.19%), followed by German Shepherds (20.26%), Labradors (8.62%), and Pomeranians (7.33%), while no positive cases were detected in Beagle, Dachshund, Rottweiler, and Great Dane breeds (Table 3). These findings are consistent with previous reports, Behera *et al.*, 2015 [4]; Mehta *et al.*, 2017 [14]; Rafiq *et al.*, 2019 [21]; Kalita *et al.*, 2022 [10]. The predominance in non-descript dogs may be related to higher population density, free-roaming behaviour, and suboptimal vaccination coverage (Khare *et al.*, 2019) [11]. Month-wise analysis showed the highest CPV prevalence in February (27.15%), followed by January (19.40%) and March (17.67%), with the lowest prevalence in May (3.88%), (Table 4). Season-wise analysis demonstrated the highest prevalence during winter (46.12%), followed by summer (38.79%) and monsoon (15.09%), (Table 5). These findings are consistent with Mehta *et al.* (2017) [14], who attributed increased winter prevalence to favourable climatic conditions for viral survival and higher whelping activity, resulting in a larger susceptible puppy population. Variations reported by Mahato *et al.* (2023) [13] may reflect regional climatic and management differences. Vaccination status-wise analysis revealed a significantly higher prevalence of CPV infection in non-vaccinated dogs (66.38%) compared to vaccinated dogs (33.62%), (Table 6), in agreement with earlier studies, Mehta, 2017 [14]; Rafiq *et al.*, 2019 [21]; Chethan *et al.*, 2021 [6]; Mahato *et al.*, 2023 [13]. The increased susceptibility in non-vaccinated puppies is likely due to the absence of protective immunity following the decline of maternally derived antibodies (Hasan *et al.*, 2016) [9]. Reports of CPV occurrence in vaccinated dogs have been attributed to inconsistent vaccination schedules and inadequate booster dosing, emphasising the need for strict adherence to standardised vaccination protocols (Agbota *et al.*, 2025) [2].

Table 1: Gender wise incidence of canine parvovirus infection

Sex	Examined dogs	Affected dogs	Disease Incidence (%), (affected dogs/positive by PCR)	Overall Incidence (%), (affected dogs/total examined dogs)	χ^2	P
Male	374	170	73.28	35.49	5.53	0.018*
Female	105	62	26.72	12.94		
Total	479	232	-	-		

* $p \leq 0.05$ statistically significant

Table 2: Age wise incidence of canine parvovirus infection

Age group	Examined dogs	Affected dogs	Disease incidence (%)	Overall incidence (%)	χ^2	P
< 3 months	121	59	25.43	12.32	0.008	1.000
3-6 months	186	90	38.79	18.79		
6-9 months	116	56	24.14	11.69		
>9 months	56	27	11.64	5.64		
Total	479	232	-	-		

$p > 0.05$: Non-significant

Table 3: Breed wise incidence of canine parvovirus infection

Breed	Examined dogs	Affected dogs	Disease incidence (%)	Overall incidence (%)	χ^2	P
Non-Descript	281	135	58.19	28.18	0.307	0.999
German Shepherd	97	47	20.26	9.81		
Labrador	41	20	8.62	4.17		
Pomeranian	35	17	7.33	3.55		
Dobermann	12	6	2.59	1.25		
Golden retriever	8	4	1.72	0.83		
Pug	5	3	1.29	0.63		
Other (Beagle/Dachshund/Rottweiler/Greatdane)	0	0	0	0		
Total	479	232	-	-		

$p > 0.05$: Non-significant

Table 4: Months wise incidence of canine parvovirus infection

Months	Examined dogs	Affected dogs	Disease Incidence (%)	Overall Incidence (%)	χ^2	P
January	91	45	19.40	9.39	0.194	1.000
February	129	63	27.15	13.15		
March	85	41	17.67	8.56		
April	46	22	9.48	4.59		
May	19	9	3.88	1.88		
June	35	16	6.90	3.34		
July	24	12	5.17	2.50		
August	23	11	4.74	2.30		
September	27	13	5.60	2.71		
Total	479	232	-	-		

$p > 0.05$: Non-significant

Table 5: Season wise incidence of canine parvovirus infection

Season	Examined dogs	Affected dogs	Disease incidence (%)	Overall Incidence (%)	χ^2	P
Winter	220	107	46.12	22.34	0.045	0.978
Summer	185	90	38.79	18.79		
Monsoon	74	35	15.09	7.31		
Total	479	232	-	-		

$p > 0.05$: Non-significant

Table 6: Vaccination status wise incidence of canine parvovirus infection

Vaccination status	Examined dogs	Affected dogs	Disease incidence (%)	Overall incidence (%)	χ^2	P
Vaccinated	159	78	33.62	16.28	0.055	0.814
Non-Vaccinated	320	154	66.38	32.15		
Total	479	232	-	-		

$p > 0.05$: Non-significant

4. Conclusion

The study highlights a high prevalence of canine parvovirus infection, with PCR proving more sensitive than rapid antigen testing. Young, male, non-descript and non-vaccinated dogs were most affected, particularly during winter, underscoring the importance of early diagnosis and strict adherence to vaccination protocols for effective disease control.

Conflict of interest

Not available

Financial Support

Not available

Reference

1. Abdalla MZ, Awooda MFA, Abubaker EAA, Mursal WI. Prevalence of canine parvovirus infection in Khartoum State, Sudan. *Asian J Res Anim Vet Sci.* 2023;11(2):105-113.
2. Agbota JD, Folitse RD, Darko EO, Kodie DO, Tasiame W, Emikpe BO. Prevalence of canine parvovirus, vaccine-related, and other factors associated with the infection in dogs presented at the veterinary teaching

hospital in Kumasi, Ghana. *PAMJ One Health.* 2025;17(11).

3. Albaz AZ, Ahmed SM, Younis E, Khodier M. Investigation of the antiviral effect of acyclovir on canine parvovirus infection. *Pharm Pharmacol Int J.* 2015;2:36-39. DOI: 10.15406/ppij.2015.02.00014.
4. Behera M, Panda SK, Sahoo PK, Acharya AP, Patra RC, Das S, *et al.* Epidemiological study of canine parvovirus infection in and around Bhubaneswar, Odisha, India. *Vet World.* 2015;8(1):33-36.
5. Buonavoglia C, Martella V, Pratelli A, Tempesta M, Cavalli A, Buonavoglia D, *et al.* Evidence for evolution of canine parvovirus type 2 in Italy. *J Gen Virol.* 2001;82(12):3021-3025.
6. Chethan GE, Singh M, Chander V, Singh D, Rajesh JB, Prasad H, *et al.* Occurrence of canine parvovirus-2 and canine adenovirus-1 infections in dogs: A hospital-based study. *Indian J Anim Res.* 2021;55(2):217-221.
7. Deka D, Phukan A, Sharma DK. Epidemiology of parvovirus and coronavirus infection in dogs in Assam. *Indian J Vet.* 2013;90(9):49-51.
8. Godsall SA, Clegg SR, Stavisky JH, Radford AD, Pinchbeck G. Epidemiology of canine parvovirus and

- coronavirus in dogs presented with severe diarrhoea to PDSA PetAid hospitals. *Vet Rec.* 2010;167(6):196-201.
9. Hasan MM, Jalal MS, Bayzid M, Sharif MAM, Masuduzzaman MA. Comparative study on canine parvovirus infection in dogs in Bangladesh and India. *Bangladesh J Vet Med.* 2016;14(2):237-241. DOI: 10.3329/bjvm.v14i2.31403.
 10. Kalita JC, Prasad A, Verma P, Singh JL, Arora N. Epidemiology of canine parvovirus infection in and around Pantnagar, Uttarakhand: A retrospective study. *Pharma Innov J.* 2022;11(11):24-30.
 11. Khare DS, Gupta DK, Shukla PC, Das G, Tiwari A, Meena NS, *et al.* Prevalence of canine parvovirus infection in dogs in Jabalpur, Madhya Pradesh. *J Entomol Zool Stud.* 2019;7(3):1495-1498.
 12. Ling M, Norris JM, Kelman M, Ward MP. Risk factors for death from canine parvoviral-related disease in Australia. *Vet Microbiol.* 2012;158(3-4):280-290. DOI: 10.1016/j.vetmic.2012.02.034.
 13. Mahato P, Khanal S, Upadhyaya MA. Retrospective study of parvovirus infection in dogs in Kathmandu. *Nepalese Vet J.* 2023;123-128.
 14. Mehta SA, Patel RM, Vagh AA, Mavadiya SV, Patel MD, Vala JA, *et al.* Prevalence of canine parvoviral infection in dogs in and around Navsari district of Gujarat State, India. *Indian J Vet Sci Biotechnol.* 2017;13(2):67-72.
 15. Minnat TR, Sadiq ZJ. Clinical examination and haematological changes of canine parvovirus with laboratory detection by rapid antigenic test. *Diyala J Vet Sci.* 2023;1(2):1-13.
 16. Mohan A, Sudhakar GK, Shobhamani B, Reddy TN. Incidence of canine parvovirus infection in and around Tirupati. *Indian J Vet Med.* 2025;45(1). DOI: 10.56093/ijvm.v45i1.168080.
 17. Nandi S, Kumar M. Canine parvovirus: Current perspective. *Indian J Virol.* 2010;21(1):31-44. DOI: 10.1007/s13337-010-0007-y.
 18. Nandi S, Sharma GK, Gupta V, Deol P, Chander V, De UK, *et al.* Global scenario of canine parvovirus mutants: epidemiology, diagnostics and immunoprophylactic agents. *JSM Vet Med Res.* 2019;2:12.
 19. Panchasheel, Sarangmath SP, Chawan P. Epidemiological and haemato-biochemical studies in parvoviral infected dogs. *Int. J Vet Sci Anim Husb.* 2024;9(1):656-659. DOI: 10.22271/veterinary.2024.v9.i1i.992.
 20. Qi S, Zhao J, Guo D, Sun D. A mini-review on the epidemiology of canine parvovirus in China. *Front Vet Sci.* 2020;7:5.
 21. Rafiq MF, Islam MR, Chowdhury KA, Hossain MM. Prevalence and therapeutic management of canine parvovirus in Bangladesh. *J Sylhet Agric Univ.* 2019;6(2):11-17.
 22. Rashid A, Rasheed K, Akhtar M. Factors influencing vaccine efficacy: A general review. *J Anim Plant Sci.* 2009;19:22-25.
 23. Reddy KB, Shobhamani B, Sreedevi B, Prameela DR, Reddy BR. Prevalence of canine parvoviral infection in dogs in and around Tirupathi, India. *Int J Livest Res.* 2015;5(3):93-99. DOI: 10.5455/ijlr.20150324084454.
 24. Sykes JE. Canine parvovirus infections and other viral enteritides. In: *Canine and feline infectious diseases*. St. Louis: Elsevier; 2014, p. 141. DOI: 10.1016/B978-1-4377-0795-3.00014-4.
 25. Zhou H, Cui K, Su X, Zhang H, Xiao B, Li S, *et al.* Overview of recent advances in canine parvovirus research: Current status and future perspectives. *Microorganisms.* 2024;13(1):47. DOI: 10.3390/microorganisms13010047.

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