SHORT COMMUNICATION

Epidemiological Study of Canine Parvoviral Enteritis in Jaipur, Rajasthan

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Abstract

Canine Parvo Virus (CPV) is a major cause of morbidity and mortality in young dogs globally. The epidemiological study was conducted in Jaipur, Rajasthan (India) to assess the occurrence of CPVE and its association with climatic and host-related risk factors over a six month period (July to December 2024). A total of 200 faecal samples from clinically suspected dogs were tested using PCR, revealing an overall CPV positive rate of 83% (166/200). Month-wise analysis demonstrated a significant decline in positivity rate from July (96.7%) to December (10.0%), correlating with climatic temperature. Statistical analysis confirmed significant associations ($p<0.05$) between CPV infection and factors like age, sex, vaccination status and breed. Puppies aged under one year and unvaccinated dogs were most susceptible. The study underscores the seasonal nature of CPVE in Jaipur and highlights the importance of early vaccination, public awareness and climate informed disease surveillance to mitigate the impact of this highly contagious disease.

Key words: Canine parvovirus, Climatic risk factors, Epidemiology, Seasonal variation, Vaccination.

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Introduction

Canine parvoviral enteritis (CPVE) is a highly contagious viral disease caused by Canine Parvovirus-2 (CPV-2), primarily affecting puppies and leading to severe gastroenteritis and high mortality rates (Grecco *et al*., 2024). The primary clinical signs of CPV-2 infection include diarrhoea, vomiting and fever. Vomiting is typically the most severe symptom, while diarrhoea and anorexia tend to be less intense. The loss of body fluids and proteins through the gastrointestinal tract leads to severe dehydration and hypovolemic shock (Sanaei *et al.,* 2025). Despite widespread vaccination efforts, CPV remains a persistent problem, especially in regions with limited awareness and vaccination coverage (Altman *et al*., 2017). Key risk factors associated with CPV include the absence of protective immunity, unhygienic environments, parasitic infestations and the animal's age (Miranda *et al*., 2015). Research on the microbiome of dogs infected with CPV-2 has revealed significant alterations in their faecal microbiota compared to uninfected control dogs. These studies have also identified an increased relative abundance of bacteria such as *Campylobacter, Bacteroides* and *Clostridium* in CPV-2 infected dogs, all of which have been linked to inflammatory bowel disease in dogs. The severity of CPV-2 infection is influenced by factors such as the animal's age, vaccine antibody titers, and the duration of illness (Sunghan *et al*., 2019). Additionally, immunization failure can occur due to the presence of maternal antibodies in puppies under 16 weeks of age (Sunghan *et al.,* 2019; Decaro *et al*., 2020). As a result, despite widespread vaccination programs, the disease remains prevalent in many populations, including those in developed countries (Melo *et al*., 2023; Ismail and Hanedan, 2024). This study was aimed to investigate the occurrence of CPVE in Jaipur, Rajasthan, India, over a six-month period and to identify potential risk factors and climatic influences associated with infection.

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Materials and Methods

The study was conducted at Veterinary Clinical Complex, PGIVER, Jaipur, Rajasthan, India during July to December, 2024. A total of 200 faecal samples were collected from dogs of Suburban locality of Jaipur presented with clinical signs suggestive of CPVE, including vomiting, diarrhoea, haemorrhagic diarrhoea, dehydration and lethargy. All the faecal samples were preserved in 1% PBS solution at

-20°C. DNA extraction was done using HipurA DNA Stool purification kit by Himedia®. Samples were tested for CPV using Polymerase chain reaction following standard protocols.

Occurrence of CPV-2 was calculated as proportion/ percentage of the presented cases with respect to various risk factors. Month-wise differences in occurrence were assessed using Pearson's chi-square test.

Results and Discussion

Overall Occurrence

Out of 200 faecal samples tested, 166 were found positive for CPV, resulting in an overall positivity rate of 83.00%. This finding aligned with previous reports from India, where CPV-2 prevalence has ranged from 72% to 85% in studies using molecular diagnostic methods like PCR (Mukhopadhyay *et al.,* 2014; Sharma *et al.,* 2016). Behera *et al.* (2015) further reported a CPV-2 detection rate of 40.8% in gastroenteritis dogs, reinforcing the significance of PCR in identifying CPV-2 infections.

Month-wise Occurrence

The positivity rate was highest in July (96.66%) and gradually decreased each month, reaching lowest in December (10.0%), with intermediate frequency in Sept-Oct-Nov months (Table 1). This pattern suggests a seasonal risk factor: the risk of Canine Parvo Viral enteritis is higher during the monsoon and post-monsoon months (July–September) and decreases as winter approaches (October–December). This could be due to climatic conditions such as increased humidity and temperature during the monsoon, which may favour the survival and transmission of the virus.

Table 1: Monthly distribution of samples, positive cases, and positivity rate of CPV-2 infection

Month	Total samples	Positive cases	Positivity rate (%)
Jul-24	30	29	96.67
Aug-24	35	28	80.00
Sep-24	40	25	62.50
Oct-24	35	18	51.43
Nov-24	30	10	33.33
Dec-24	30	3	10.00

Risk Factor Analysis

Age*:* The study examined the age-wise distribution of dogs affected by Canine Parvovirus (CPV-2) infection among 166 cases. Puppies aged 40 days to 6 months were the most affected group, constituting 33.13% (55/166) of the cases, followed closely by dogs aged 6 months to 1 year at 32.53% (54/166). Dogs between 1 and 2 years accounted for 12.05% (20/166) of infections, while those aged 2 to 3 years represented only 4.82% (8/166). Interestingly, 17.47% (29/166) of cases occurred in dogs aged 3 years and above. These findings indicate that younger dogs, particularly those under one year, are at higher risk for CPV-2 infection, emphasizing the importance of early vaccination and preventive care in this vulnerable age group.

Sex*:* Out of the 166 cases, males were more commonly affected, accounting for 57.23% (96/166) of the cases, while females represented 42.77% (70/166).

Vaccination Status*:* Out of the 166 total cases of CPV, 35 cases (21.08%) were reported in fully vaccinated dogs, 19 cases (11.45%) in dogs that had received only the first dose, and the majority 112 cases (67.47%) were observed in non-vaccinated dogs. Statistical analysis revealed a highly significant association between vaccination status and the occurrence of the disease, indicating that vaccination significantly reduces the risk of infection. The data suggest that full vaccination offers substantial protection, while non-vaccinated dogs are at a much higher risk of contracting the virus.

Breed: The study analysed the distribution of dog breeds affected by CPV-2 infection among 166 positive cases. Non-descript dogs were the most affected, accounting for 37.95% (n=63) of the cases, indicating higher susceptibility in mixed breeds. German Shepherds were the second most affected breed at 24.70% (n=41), followed by Labradors at 14.46% (n=24). Smaller breeds like Pomeranians (n=11, 6.63%), Golden Retrievers (n=9, 5.43%), and Beagles (n=6, 3.61%) also showed significant infection rates. Less commonly affected breeds included Shih Tzus (n=5, 3.01%), Pugs (n=4, 2.41%), Dobermans (n=2, 1.20%), and Siberian Huskies (n=1, 0.60%).

These findings on various risk factors and occurrence of CVP-2 were consistent with previous research conducted by Behara *et al.* (2008), Gombac *et al.* (2008), Nandi and Kumar (2010), and Decaro and Buonavoglia (2012). Risk factor analysis confirmed that puppies and unvaccinated dogs are at higher risk of CPV infection, emphasizing the importance of early vaccination. Future studies integrating finer-scale climatic data, vector analysis, and longer observational periods are recommended to refine predictive models for CPVE outbreaks.

This study highlights the strong association between climatic variations and the occurrence of Canine Parvoviral Enteritis (CPVE) in Jaipur, Rajasthan, the highest occurrence being in monsoon months, in puppies, and unvaccinated dogs. Significant associations were found between infection rates and host factors such as age, sex, breed, and vaccination status. The findings emphasize the need for timely vaccination, public awareness, and climate-based disease monitoring. Early intervention strategies could play a vital role in minimizing outbreaks. Continued surveillance and integration of climatic data in veterinary healthcare planning are recommended.

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