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Canine parvovirus: Prevalence and insights in Baijnath block, Kangra district of Himachal Pradesh

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Abstract

Canine parvovirus (CPV) is a highly contagious viral disease affecting dogs, especially young puppies. This study was conducted to determine the prevalence of CPV infection in dogs presented to veterinary facilities in Baijnath Block, Kangra District, Himachal Pradesh. A total of 119 confirmed CPV cases were analyzed based on sex, age, breed, and vaccination status.

Male dogs showed a higher prevalence (71.43%) than females (28.57%). Age-wise analysis revealed that puppies below six months were most affected (41.18%), followed by dogs aged 6–12 months (17.65%) and 1–3 years (16.81%). Breed-wise, nondescript dogs had the highest prevalence (38.66%), followed by Pugs (31.09%), Indies (17.65%), and Pomeranians (12.61%). Regarding vaccination status, 38.66% of affected dogs were unvaccinated, while 61.34% had a vaccination history. The findings highlight the continued importance of CPV and the need for effective vaccination and disease-prevention measures.

Keywords: Transmission, canine parvovirus, vaccination, age and sex distribution

1. Introduction

One of the most significant and contagious viral diseases affecting domestic dogs globally is canine parvovirus (CPV). CPV is still a major cause of morbidity and mortality, especially in young puppies, and has spread quickly across continents since its emergence in the late 1970s (Appel, 1987; Parrish, 1995) ^[1, 2]. The virus is thought to have successfully spread throughout the world after evolving from the feline panleukopenia virus through genetic mutations that allowed adaptation to canine hosts (Parrish, 1995; Decaro & Buonavoglia, 2012) ^[2, 3]. CPV is still reported globally despite the availability of effective vaccines, particularly in regions with low vaccination rates and subpar management techniques (Decaro & Buonavoglia, 2012) ^[3].

The small, non-enveloped, single-stranded DNA virus known as canine parvovirus is a member of the Parvoviridae family. The virus causes severe gastroenteritis, immunosuppression, and dehydration by mainly targeting rapidly dividing cells of the intestinal crypts, bone marrow, and lymphoid tissues (Greene & Decaro, 2012) ^[4]. Because of its high environmental resistance and long-term survival in contaminated environments, CPV is effectively transmitted through the fecal–oral route (Miranda & Thompson, 2016) ^[5].

Vomiting, hemorrhagic diarrhea, anorexia, lethargy, fever, dehydration, and leukopenia are typical clinical signs, and very young puppies may develop myocarditis (Greene & Decaro, 2012) ^[4]. The original CPV-2 strain has continued to evolve since it first appeared, giving rise to the antigenic variants CPV-2a, CPV-2b, and CPV-2c (Truyen, 2006) ^[6]. According to recent molecular research, CPV-2c is becoming more common in a number of nations, including India, which suggests that the virus is still evolving and adapting (Decaro *et al.*, 2020; Harish Reddy *et al.*, 2024) ^[7, 8]. Multiple CPV variants are still in circulation, which emphasizes the significance of routine epidemiological surveillance and field strain molecular characterization (Jyothi *et al.*, 2024; Zhou *et al.*, 2025) ^[9, 10].

Age, breed, sex, vaccination status, maternal antibody interference, environmental contamination, and management practices are some of the variables that affect the incidence of CPV infection (Appel, 1987; Greene & Decaro, 2012) ^[1, 4].

Due to their developing immune systems and diminishing maternal antibodies, puppies between the ages of six weeks and six months are especially vulnerable (Parrish, 1995) [2]. The persistence of the virus in the environment, incomplete vaccination schedules, and vaccine failure all contribute to disease outbreaks even though vaccination is still the most effective preventive measure (Decaro *et al.*, 2020) [7].

Developing successful prevention and control strategies requires an understanding of the prevalence of CPV infection and the risk factors associated with it (Patronek *et al.*, 1985; Head *et al.*, 1996) [11, 12]. Nevertheless, little is known about the prevalence of CPV in many regions of Himachal Pradesh. In order to ascertain the prevalence of canine parvovirus infection in dogs brought to veterinary clinics in Baijnath Block, Kangra District, Himachal Pradesh, and to assess its correlation with variables like age, sex, breed, and vaccination status, the current study was conducted.

2. Materials and Method

To assess the prevalence of canine parvovirus (CPV) infection in dogs, a descriptive cross-sectional study was carried out. Clinical records, both prospective and retrospective, were gathered from veterinary clinics in Himachal Pradesh's Baijnath block (32.0521°N and 76.6493°E). There were 119 confirmed cases of CPV in all. Cases with incomplete records were excluded, but dogs of all ages, sexes, and breeds diagnosed by clinical examination and laboratory testing (PCR or fecal antigen test) were deemed eligible. A structured format was used to record information on age, sex, vaccination status, month of occurrence, and major clinical signs. Prior to data collection, the required permissions were acquired, and all information was kept private and secure. Descriptive statistics were used to analyse the gathered data. To ascertain the distribution of CPV cases by age, sex, vaccination status, and month of occurrence and percentages

were computed. Data were collected from January 2024 to December 2025.

3. Result and Discussion

A total of 119 canine infected dogs were investigated Baijnath block, January 2024 to December 2025. The current study looked at the canine parvovirus (CPV) infection of 119 dogs in relation to breed, sex, and immunization status. Non-descript dogs had the highest incidence of infection when compared to pedigree dogs, possibly due to lower vaccination coverage and increased environmental exposure (Decaro *et al.*, 2022) [19]. According to Miranda and Thompson (2016) [5], male dogs were more likely to be impacted (71.43%) than female dogs (28.57%). This could be because male dogs are more likely to roam and be exposed to contaminated environments. Based on typical clinical symptoms, such as vomiting, dehydration, fever, loss of appetite, and bloody diarrhea, a veterinarian determined that the dogs had canine parvovirus (CPV).

4. Sex -wise Prevalence

The data regarding sex-wise prevalence of Canine Parvo Virus infection is presented in table 1

Table 1: Sex -wise prevalence of dogs affected with Canine parvo virus infection

Sex	No. of dogs affected	Percentage (%) of dogs affected
Male	85	71.43
Female	34	28.57
Total	119	100

The data showed that male dogs had a higher percentage of canine parvovirus infection (71.43%) compared to female dogs (28.57%). Similarly, studies found that male dogs were more likely than female dogs to be infected with CPV (Behera *et al.*, 2015; Mohan *et al.*, 2025) [13, 17].

Table 2: Breed-wise prevalence of dogs affected with canine parvovirus infection

Breed	No. of dogs affected	Percentage (%) of dogs affected	Male	Female
Non- descript	46	38.66	33	13
Indie dog	21	17.65	15	6
Pomeranian	15	12.61	11	4
Pug	37	31.09	26	11
Total	119	100	85	34

In line with the findings of Archana *et al.* (2009) and Mohan *et al.* (2025) [14, 17], who reported a higher prevalence of CPV infection among non-descript dogs, the current study found that canine parvovirus infection was highest in non-descript dogs (38.66%), followed by Pugs (31.09%), Indies (17.65%), and Pomeranians (12.61%).

Table 3: Vaccination status of dogs affected with Canine parvovirus

Sex	Total dogs	Vaccinated	Unvaccinated
Male	85	54	31
Female	34	19	15
Total	119	73	46

Out of the 119 dogs examined, 73 had received vaccinations. Vaccination rates were higher in male (54) than in female (19). 46 dogs were street dogs and no date of vaccinated was proceed. Overall, a higher percentage of dogs had received vaccinations which is in line with earlier findings that describe higher vaccination coverage among owned dogs

brought to veterinary clinics (Day *et al.*, 2016; Singh *et al.*, 2022) [15, 16].

Table 4: Age- wise prevalence of dogs affected with canine parvovirus

Age	Male	Female	Percentage (%) of affected dogs	Total
<6months	38	11	41.18	49
6-12months	15	6	17.65	21
1-3years	13	7	16.81	20
4-6years	14	1	12.61	15
7-10years	3	2	4.20	5
>10years	2	7	7.56	9
Total	85	34	100	119

Male dogs made up a larger percentage of cases (71.43%) than female dogs (28.57%), which is in line with earlier findings showing that males are more vulnerable to canine parvovirus (CPV) infection (Behera *et al.*, 2015) [13]. Dogs under six months old had the highest prevalence (41.18%), confirming previous research showing that young puppies

were especially susceptible due to declining maternal antibodies and incomplete immune development (Nandi & Kumar, 2010) ^[18]. 17.65% and 16.81% of cases involved dogs between the ages of 6 and 12 months and 1 and 3 years, respectively. Miranda and Thompson (2016) ^[5] have reported similar age-related patterns. Conversely, only 7.56% of afflicted dogs were older than ten years, which is probably due to protective immunity from previous exposure or vaccination (Decaro & Buonavoglia, 2012) ^[3].

Table 5: Month- wise prevalence of dogs affected with canine parvovirus

Months	Male		Female		Total affected Dogs	Percentage
	2024	2025	2024	2025		
January	5	26	0	10	41	40.38
February	1	11	2	6	20	19.23
March	2	6	1	2	11	10.58
April	1	10	0	3	14	13.46
May	0	7	0	3	10	9.62
June	0	0	0	0	0	0.00
July	0	1	0	0	1	0.96
August	0	1	0	0	1	0.96
September	0	2	0	0	2	1.92
October	0	1	2	0	3	2.88
November	2	1	1	0	4	3.85
December	8	1	1	2	12	11.54
Total	19	67	7	26	119	100

Out of 119 cases of CPV most cases were found in January (40.38%), February (19.23%), and April (13.46%), with no cases reported in June. Decaro and Buonavoglia (2012) ^[3] reported similar seasonal variations in CPV incidence. Male dogs were more frequently impacted than female dogs, which is consistent with the results of Behera *et al.* (2015) ^[13]. A seasonal pattern of CPV infection was suggested as the higher incidence during the winter. As stressed by Miranda and Thompson (2016) ^[5], these results underscored the significance of prompt vaccination and appropriate disease management to lower CPV infections in dogs.

5. Conclusion

Canine parvovirus (CPV) is still a serious infectious disease that primarily affects young, unvaccinated puppies. It poses a serious threat to veterinary health due to its high transmissibility, environmental persistence, and capacity to harm rapidly dividing cells. The virus's ongoing genetic variation may affect the incidence of disease and the efficacy of vaccines, underscoring the necessity of routine surveillance. Based on confirmed CPV cases from veterinary clinics in the Baijnath block, the current cross-sectional study found that age, sex, and vaccination status were significant predictors of CPV occurrence. While more research is required to improve prevention and control strategies, strengthening vaccination programs, enhancing hygiene practices, and raising owner awareness are crucial for lowering disease incidence and mortality.

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