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Studies on the occurrence of canine parvoviral enteritis in Gannavaram: Investigating viral prevalence and impact in domestic dog populations

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Abstract

The present study was carried out to evaluate the occurrence of canine parvoviral (CPV) enteritis in dogs at VCC, NTR College of Veterinary Science, Gannavaram during the period of May to December 2021. Out of 3,019 dogs presented 328 dogs exhibited signs of haemorrhagic gastroenteritis suggestive of CPV infection, with an overall incidence of 10.86 per cent. Among these, 40 dogs were screened using a rapid one-step immunochromatographic antigenic assay, confirming CPV infection in 36 dogs, which were subjected to detailed epidemiological investigation. CPV infection was predominantly observed in male, irregularly vaccinated, non-descript dogs aged 3-6 months, presenting with foul-smelling diarrhoea (with or without blood), dehydration, inappetence/anorexia, vomiting, cutaneous or erythematous lesions, and pale or congested mucous membranes. Age-wise analysis revealed the highest occurrence (44.45%) in the 3-6-month age group, with males represented 58.33 per cent of cases. Most affected dogs were non-descript breeds (27.78%), and 47.22 per cent were unvaccinated. These findings are consistent with previous reports, reaffirming the increased susceptibility of unvaccinated or incompletely vaccinated dogs to CPV enteritis. The study also highlights breed- and age-related variations in disease prevalence. Regular and complete vaccination is critical for maintaining protective immunity, particularly in dogs exposed to stressful environments, immunosuppressive conditions, or direct contact with infected animals. The insights generated may support improved veterinary public health strategies and guide pet-care practices aimed at controlling the spread of canine parvoviral enteritis.

Keywords: Canine parvoviral enteritis, prevalence, vaccination

1. Introduction

Canine parvoviral enteritis (CPE), caused by canine parvovirus type 2 (CPV-2), is one of the most widespread and fatal infectious diseases in young and unvaccinated dogs. The virus, a small non-enveloped single-stranded DNA virus of the family *Parvoviridae*, is highly contagious and transmitted primarily through the faecal-oral route. Following infection, the virus replicates in rapidly dividing cells of the lymphoid tissues and intestinal crypts, resulting in severe vomiting, foul-smelling hemorrhagic diarrhea, dehydration, leukopenia, and in some cases, sudden death due to myocarditis (Zhao *et al.*, 2016) [21]. Puppies below six months of age are particularly susceptible, and mortality remains high despite treatment.

CPV-2, believed to have originated from feline panleukopenia virus (Clegg *et al.*, 2012) [2], was first reported in India in 1981, since then become endemic across the country. Shedding of the virus may continue for several weeks, contributing to widespread contamination. The severity of clinical disease is influenced by age, immune status, viral virulence, infectious dose, and concurrent infections (Deepti *et al.*, 2013) [4]. Due to the rapid progression of the disease, timely diagnosis is critical. CPV immunochromatographic lateral assay rapid tests provide quick and reliable detection and are widely used in clinical settings (Decaro *et al.*, 2010) [3].

High morbidity and mortality associated with CPE continue to pose challenges for veterinarians in India, even in vaccinated dog populations. Reports from regions such as Gannavaram (Vijayawada) indicate a higher incidence in young, growing dogs, particularly

between 3-6 months of age (Tajpara *et al.*, 2009) [20]. Given the endemic nature of CPV-2 and its significant health impact, the present study investigates the prevalence of canine parvoviral enteritis with respect to age, breed, gender, and vaccination status in dogs in Andhra Pradesh, India.

Materials and Methods

In the present study, screened a total of 3019 dogs of different breeds, age groups of either sex were presented to Small Animal Medicine ward, VCC, NTR CVSc, Gannavaram during the period between May 2021 to December 2021 and found 498 dogs with signs of gastro-enteritis. Among these, 328 dogs had symptoms of haemorrhagic gastroenteritis suggestive of canine parvoviral enteritis. Where, 40 dogs were selected and screened by rapid one step immunochromatographic antigenic assay confirming CPV in 36 dogs in which detailed investigation was taken up.



Fig 1: Immunochromatography test kit



Fig 2: ICH test kit with positive result



Fig 3: CPV affected pup showing dullness and lethargic



Fig 4: Signs of vomiting and diarrhea

Results and Discussion

Out of 3019 dogs presented during study period, 328 dogs had signs of dullness, fever, anorexia, lethargy, depression, vomiting, mucoid to hemorrhagic and foul smelling diarrhoea, suggestive of canine parvoviral enteritis with an overall occurrence of 10.86 per cent. Epidemiological investigation was conducted in 36 dogs with canine parvoviral enteritis was confirmed by using rapid immunochromatographic assay. The overall occurrence of canine parvoviral enteritis observed in the present study was lower when compared to Mossallenijad *et al.* (2008) and Shima *et al.* (2015) [18] who were reported --- and 52.9% respectively, which might be due to regular vaccination and proper management practices. The present findings were in partial agreement with that of Khare *et al.* (2019) [11] who observed the occurrence of CPV in dogs was 7.24 per cent.

The age wise distribution of CPV (Table 1) in the present study indicated a predominance in puppies aged between 3-6 months (44.45%) followed by <3 months (22.22%) and 6-9 months (19.44%) and least in above 9 months (13.89%). The findings are in accordance with the observations of Panchasheel and Chawan (2024) [14], who indicated a greater prevalence of CPV in the 3-6 months age group compared to <3 months age group, followed by the 6-12 months and >12 months age groups. The findings in the study were in partial agreement with the Tajpara *et al.* (2009) [20] who recorded higher incidence of CPV in dogs below six months (30.30%) when compared to above one year (15.60%) aged dogs. The possible variation in these results might be due to lack of protective immunity and an increased number of growing and dividing cells which were the predilection sites for viral replication (Greene and Decaro, 2012) [6].

The findings of the present study were in partial agreement with that of Khare *et al.* (2019) [11] who reported highest prevalence (11.9%) in <3 months aged dogs. In contrast to the present findings, Horecka *et al.* (2020) [7] reported that age had no significant difference on the prevalence of CPV in dogs. Least incidence was recorded in above one year age group, which might be due to developmental antibodies in the adults either due to vaccination schedule practiced or due to mild exposure to virus (Miranda *et al.*, 2015) [12].

Table 1: Age wise prevalence of canine parvovirus in dogs

S. No.	Age group	No. of CPV affected dogs	Prevalence (%)
1	< 3 month	8	22.22
2	3 - 6 month	16	44.45
3	6 - 9 month	7	19.44
4	>9 month	5	13.89
	Total	36	100

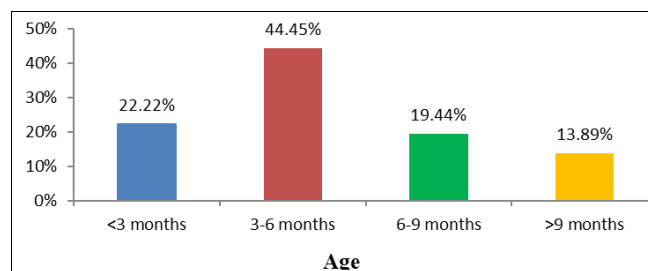


Chart 1: Age wise occurrence of Canine parvoviral enteritis in dogs

The gender wise occurrence of canine parvoviral enteritis (Table 2) infection in the present study was higher in males (58.33%) than females (41.67%) which was similar to that observed by Surendhar *et al.* (2018) [19] who reported 67.60 per cent of incidence in males attributed due to the dominant male population in the area of study. Whereas Deka *et al.* (2013) [5] reported the higher prevalence in male dogs due to certain behavioural pattern and selective preference of keeping male dogs by pet owners. The results were also in accordance with findings of Rafiq *et al.* (2019) [17] who reported higher prevalence in male dogs (38.70%) than females (21.1%).

Table 2: Gender wise prevalence of canine parvovirus in dogs

S. No.	Sex	No. of CPV affected dogs	Prevalence (%)
1	Male	21	58.33
2	Female	15	41.67
	Total	36	100

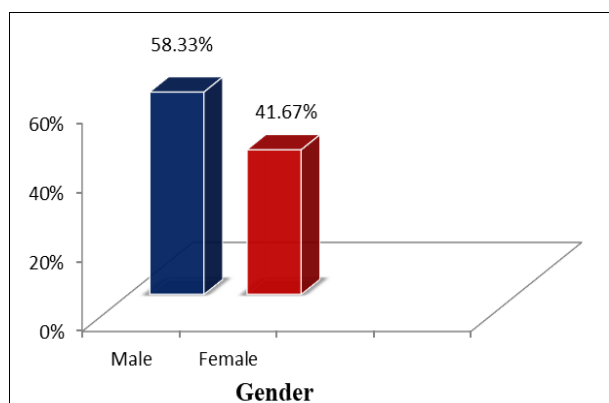


Chart 2: Gender wise occurrence of canine parvoviral enteritis in dogs

Among the breeds, highest prevalence was recorded in Non-descript dogs (27.78%) followed by Labrador Retriever and German Shepherd breeds (19.44% each), Spitz (11.11%), Rottweiler (8.33%), whereas Beagle, Dachshund, Doberman, Cocker spaniel and Shih Tzu breeds represented lowest (2.78% each) (Table 3). The present finding was in accordance with the observations of Khare *et al.* (2019) [11] and Archana *et al.* (2010) [1] who observed higher prevalence of CPV in Non-descript breeds followed by Great Dane, German Shepherd, Dalmatian, Labrador, Spitz, Doberman when compared to Lhasa apso. The findings were also in agreement with Rafiq *et al.* (2019) [17] who reported highest occurrence in indigenous (40%) followed by German shepherd, Spitz, Lhasa apso and Doberman. On the contrary to these findings, Prittie (2004) [16] and Houston *et al.* (1996) [8] observed Rottweilers followed by Doberman Pinschers and German Shepherd dogs were at higher risk for developing CPV enteritis, compared with that for mixed-breed dogs.

Variation in the occurrence among different breeds might be due to population density of breed which varies from one geographical area to another (Archana *et al.*, 2010) [1].

Table 3: Breed wise prevalence of canine parvovirus in dogs

S. No.	Breed	No. of CPV affected dogs	Prevalence (%)
1	Non Descriptive	10	27.78
2	Labrador	7	19.44
3	German Shepherd	7	19.44
4	Spitz	4	11.11
5	Rottweiler	3	8.33
6	Beagle	1	2.78
7	Daschund	1	2.78
8	Cocker spaniel	1	2.78
9	Doberman	1	2.78
10	Shih Tzu	1	2.78
	Total	36	100

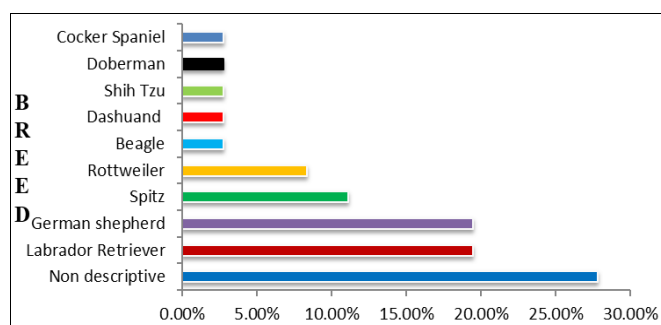


Chart 3: Breed wise occurrence of canine parvoviral enteritis in dogs

In relation to vaccination status, 47.22% of CPV dogs were irregularly vaccinated, 30.56% represented unvaccinated and 22.22% were vaccinated (Table 4). The findings were in agreement with the Houston *et al.* (1996) [8] who reported that unvaccinated dogs were 12.70 times more likely to get CPV enteritis than vaccinated dogs. Similar findings were recorded by Zourkas *et al.* (2015) [22] and Ismail and Hanedan (2024) [9], who observed higher prevalence of CPV was recorded in unvaccinated dogs (52.90%) than those vaccinated (27.90%) and improperly vaccinated dogs (19.10%). The occurrence of CPV in vaccinated dogs may be due to interference with maternal derived antibodies as the common cause of vaccine failure in dogs (Pollock and Carmichael, 1982) [15].

Table 4: Occurrence of canine parvoviral enteritis based on vaccination status

S. No.	Vaccination status	No. of CPV affected dogs	Per cent
1	Vaccinated	8	22.22
2	Unvaccinated	11	30.56
3	Irregularly vaccinated	17	47.22
	Total	36	100

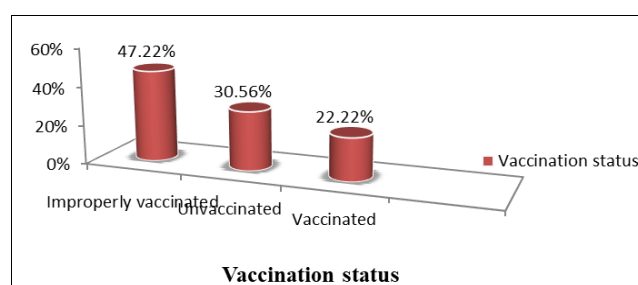


Chart 4: Occurrence of canine parvoviral enteritis based on vaccination status

Conclusion

Overall occurrence of canine parvoviral enteritis was 10.86% and majority (45.0%) of the affected dogs were aged between 3-6 months significantly, 47.22% of the infected dogs were irregularly vaccinated. The study further revealed that the majority of affected dogs were of the Nondescript breed (32.5%), followed by Labrador and German shepherd (17.5%) and a higher prevalence was observed in male dogs (55.0%). These findings emphasize the critical role of regular vaccination and highlight the increased risk among specific breeds, age groups, and gender.

Conflict of Interest

Not available

Financial Support

Not available

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