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Epidemiological Study of Canine Parvo Virus Infection in Pet Dogs at Ahmedabad City, Gujarat, India

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ABSTRACT

Background: Canine Parvo virus (CPV) infection is one of the devastating diseases of viral etiology affecting all age group of dogs and most commonly its occurrence is seen in pups below eight weeks age causing nearly 90 per cent mortality.

Methods: In our study, 348 samples were collected from pet dogs with clinical symptoms such as bloody diarrhoea, gastro enteritis and lethargy over the period of 3 years (2020 to 2022) at Gujarat Veterinary Research and Diagnostic Centre, Ahmedabad and investigated further using Canine Parvovirus Rapid Antigen Test Kit (Ubio Biotechnology Systems).

Result: Total 214 (61.49%) cases were reported to be positive. CPV infection was higher (89.72%) in age group with pet dogs less than 6 months, sex wise prevalence was higher in males (79.9%) whereas season wise higher rates were evident in winter (22%).

Key words: Dog, Prevalence, Prevention, Risk factors, Vaccination, Veterinary disease.

INTRODUCTION

Dogs have become essential in human life, representing love and companionship. Given the importance of dogs, it is crucial to examine the various diseases that lead to significant morbidity and fatality rates. Among the viral diseases commonly encountered are canine parvoviral infection, canine distemper, coronavirus infection, canine hepatitis, canine parainfluenza and rabies (Bargujar *et al.,* 2011). Numerous infectious diseases are prevalent among dogs in India and globally, but certain severe conditions are more frequently observed in Gujarat and the southern regions of the state. These illnesses encompass canine distemper virus infection, canine gastroenteritis, canine parvovirus infection, canine leptospirosis, canine babesiosis, rabies and other infectious diseases that present significant risks to the well-being of dogs. Such diseases adversely affect the health of dogs and many of them can be lethal.

Canine parvovirus (CPV) infection is a highly contagious viral disease that raises serious concerns for pet owners, veterinarians and researchers due to its elevated rates of morbidity and mortality. Canines of all ages and breeds are at risk of contracting parvovirus, but puppies aged 6 to 16 weeks appear to be the most vulnerable. The transmission of CPV infection typically occurs through the fecal-oral route when susceptible dogs come into contact with the faeces of infected dogs or surfaces contaminated by them (Bhattacharjee *et al.,* 2021). After entering the body CPV initially replicates in the pharyngeal lymphoid tissue and Peyer's patches. CPV infection pups died mostly due to acute heart failure (Nandi and Kumar 2010). While in older pups, the CPV invades the actively dividing epithelial cells of the crypts in the small intestine which leads to diarrhoea because loss of cells from the intestinal crypts leads to blunting of villi and absorptive and digestive capacity may be reduced (Biswas *et al.,* 2006; O'Connor *et al.,* 2013). Despite development and administration of vaccination against CPV strains are practised, the disease is still one of the considerable veterinary and economic important. This paper describes various epidemiological factors leading to CPV infection in pet dogs in Ahmedabad city in Gujarat, India.

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MATERIALS AND METHODS

In this study, 348 samples (faecal swabs) were collected over the period of 3 years (2020 to 2022) from pet dogs having bloody diarrhoea, gastro enteritis and lethargy at Gujarat Veterinary Research and Diagnostic Centre, Ahmedabad and investigated further using Canine Parvovirus Rapid Antigen Test Kit (Ubio Biotechnology Systems).

Further, the data is divided into 6 parts based on the Indian calendar of season. Winter (January-February), Spring (March-April), Summer (May-June), Monsoon (July-August), Autumn (September-October), Pre-winter (November-December). These Indian seasons are preferred to analyse

the pathogenicity of virus further, the sex wise incidence and prevalence in various age groups were analysed (Kanesh *et al*., 2025).

RESULTS AND DISCUSSION

A total of 348 samples have been analysed in 3 years (2020 to 2022) for CPV infection out of which 214 (61.49%) cases were reported to be positive.

In 2020, the annual seasonal prevalence of CPV infection is found to be highest during monsoon (Fig 1). In 2021, the annual seasonal prevalence of CPV infection is found to be highest during spring (Fig 2). In 2022, the annual seasonal prevalence of CPV infection is found to be highest during summer (Fig 3). The overall seasonal prevalence of CPV infection in 3 years is found to be winter (22%), summer (20%), monsoon (18%), spring (17%) autumn (13%), pre-winter (10%) (Fig 4).

Out of the 214 cases reported to be positive for CPV infection in a period of 3 years, 43 (20.09%) cases were female and 171 (79.9%) cases were male pets (Fig 5). The age distribution of 214 cases reported to be positive for CPV infection is as follows: 117 (54.67%) cases were of pet dogs less than 2 months, 58 (27.1%) cases were of 2-4 months of age, 17 (7.94%) cases were of 4-6 months whereas 22 (10.28%) cases were more than 6 months of age (Fig 6).

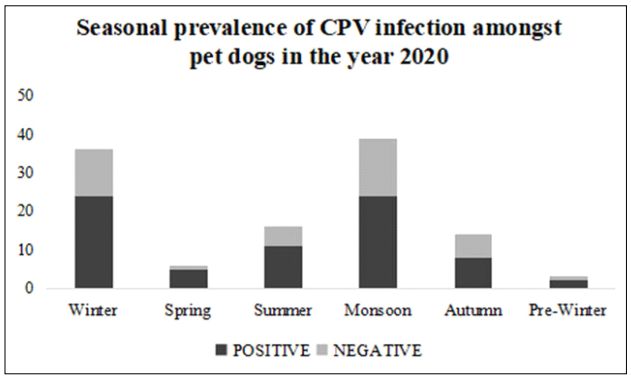


Fig 1: Seasonal prevalence of CPV infection amongst pet dogs in the year 2020.

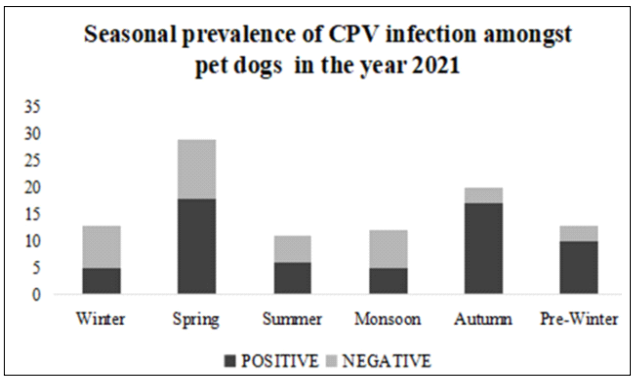


Fig 2: Seasonal prevalence of CPV infection amongst pet dogs in the year 2021.

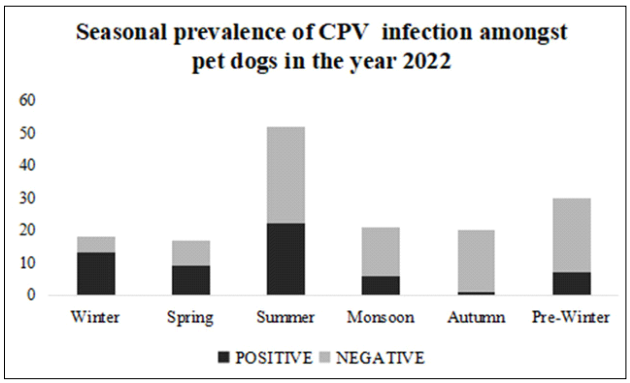


Fig 3: Seasonal prevalence of CPV infection amongst pet dogs in the year 2022.

The overall prevalence of CPV infection has been investigated in various regions of India making up to 30% in Rajasthan (Tanwar *et al.*, 2020), 10% in Madhya Pradesh (Kanesh *et al.*, 2025), 30% in Maharashtra (Bhosale *et al.*, 2024) 41.15% in Uttarakhand (Kalita *et al.,* 2022), 41.66% in Uttar Pradesh (Chetan *et al.*, 2021) and 40.85% in Odisha (Behera *et al.*, 2015). In Gujarat, studies show 43.44% prevalence in Navsari district (Mehta *et al.*, 2017) and 33.94% prevalence in South Gujarat (Desai *et al.*, 2020). Our study depicts a prevalence of 61.49% in a period of 3 years which is relatively higher than previous studies in India (Table 1).

In various studies the sex ratio of incidence of CPV infection is found to be higher in male dogs (Table 2) which is in agreement with our study showing 79.9% infected

Table 1: Year wise annual prevalence rate of CPV infection in our study.

Year	Prevalence rate
2020	64.91%
2021	58.08%
2022	62.24%

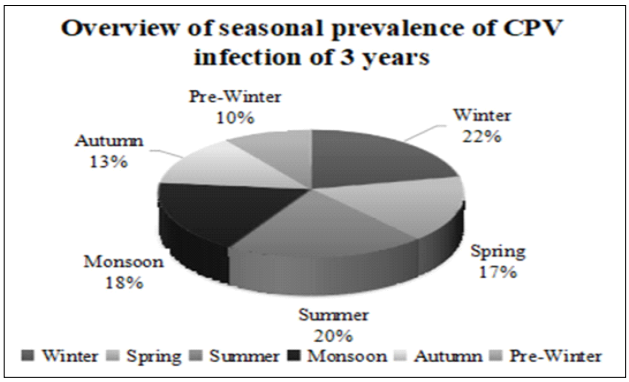


Fig 4: Overview of seasonal prevalence of CPV infection of 3 years.

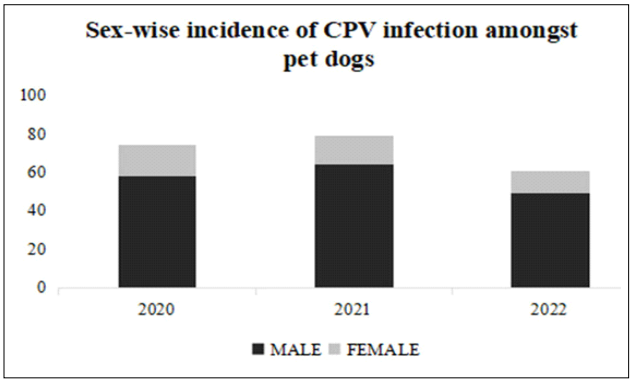


Fig 5: Sex-wise incidence of CPV infection of 3 years.

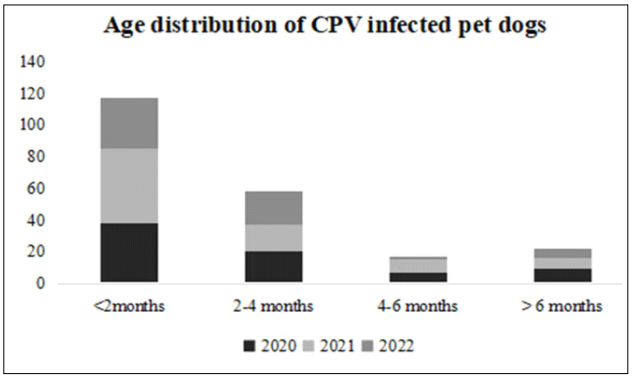


Fig 6: Age distribution of the CPV infected pet dogs of 3 years.

Table 2: Proportion of male dogs infected by CPV in various regions of India.

Infected males	Area of study	References
68.88%	Himachal Pradesh	Bhatt *et al.*, 2015
68.75%	Andhra Pradesh	Bhargavi *et al.*, 2017
86.21%	Odisha	Behera *et al.*, 2015
63.57%	Uttarakhand	Kalita *et al.*, 2022
70%	Tamil Nadu	Geetha and Selvaraju, 2023
71.64%	Madhya Pradesh	Jayprasad *et al.*, 2025

dogs to be males. Meanwhile, a fewer studies show in Uttar Pradesh showed higher incidence of positivity in female dogs (Chetan *et al.*, 2021).

Our study shows an 89.72% incidence of CPV infection in dogs less than 6 months of age which is in agreement with previous studies as 66.26%, 69.42% and 72.66% incidence of CPV infection in dogs less than 6 months of age has been reported in studies from South Gujarat (Desai *et al.,* 2020), Rajasthan (Tanwar *et al.,* 2020) and Tamil Nadu (Geetha and Selvaraju, 2023) respectively.

Our study depicts the highest seasonal prevalence of CPV infection in winter with an incidence rate of 22%. Similar findings have been reported in previous studies held in Navsari, Gujarat (Mehta *et al.,* 2017). Meanwhile, a study in Uttarakhand show the highest seasonal prevalence in spring with an incidence rate of 33% followed by winter with an incidence rate of 29.07% (Kalita *et al.,* 2022). A higher prevalence in the winter may indicate a high susceptibility due to peak breeding season.

CONCLUSION

In our study, CPV infection was higher in age groups (less than 6 months) 89.72% whereas sex wise prevalence was higher in males (79.9%), season wise, higher rates were evident in winter (22%). Public awareness campaigns regarding pet vaccinations should be put into place to prevent the disease.

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Conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this article. No funding or sponsorship influenced the design of the study, data collection, analysis, decision to publish, or preparation of the manuscript.

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