



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2019; 7(3): 1495-1498

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Received: 16-03-2019

Accepted: 18-04-2019

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Prevalence of canine parvovirus infection in dogs in Jabalpur (M.P.)

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Abstract

The study was conducted on 980 dogs suffering from vomiting and diarrhoea from August 2017 to January 2018. The dogs were screened by Scan vet Parvo™ kit for the diagnosis of canine parvovirus infection. Age, sex, breed and feeding habits of each dog were recorded to study the prevalence of canine parvovirus. The overall prevalence of canine parvovirus infection in dogs was reported as 7.24%. Dogs between 0-3 months of age showed the highest prevalence 11.9% followed by 3-6 months of age 7.09% and 6-12 months of age 5.31%. Whereas, the lowest prevalence of canine parvovirus was reported in the dogs above 12 months of age. The sex wise prevalence revealed higher prevalence in male (7.91%) as compared to female (6.36%). The maximum prevalence was noticed in non-descript dogs i.e. 12.57% followed by Great dane, German shepherd, Spitz, Dalmatian, Labrador, Doberman and Lhasa apso in which prevalence was found to be 10%, 6.12%, 5.26, 3.82%, 3.61%, 3.57% and 2.77% respectively. During the present study the dogs reared on vegetarian diet showed significantly higher prevalence i.e. 8.90% as compared to dogs reared on non-vegetarian diet i.e. 3.38%.

Keywords: Canine parvovirus (CPV), scan vet parvo kit, epidemiology and gastroenteritis

Introduction

Canine parvovirus (CPV) infection is an infectious and contagious viral disease of canine especially dogs. Parvovirus comes from Latin word "Parvus" which means small and probably due to this reason this virus is known as parvovirus. Dogs of all age groups may be infected but puppies of 3 months of age are highly susceptible than adults^[6]. This virus causes high morbidity (100%) and frequent mortality upto 10% in adult dogs and 91% in pups^[1]. Canine parvovirus (CPV) emerged in the late 1970s, probably from feline panleukopenia virus via genetic mutations and evolution^[20].

Canine parvovirus is an important pathogen of dogs and is responsible for serious occurrences of morbidity and mortality despite the availability of safe and effective vaccines. It is a highly contagious viral disease that can produce life threatening illness in puppies and adult dogs. It can be transmitted by any person, animal or object that comes in contact with an infected dog's faeces. CPV infects and replicates in rapidly dividing cells, most notably the lymphoid organs, latter myeloid progenitor cells in the bone marrow and intestinal epithelial cells. Replication results in cell destruction, causing a clinical disease characterized by severe vomiting, brownish or bloody foul smelling diarrhoea, dehydration and neutropenia. This disease is almost universally fatal without treatment, with reported survival rates of only 9% in an experimental model. The clinical manifestations of CPV infection depends on the age and immune status of the dogs, virulence of the virus, dose of the virus and pre-existing or concurrent parasitic, bacterial or virus infections^[12]. Since last decade, the parvo suspected pups are increasing to OPD. Hence, the present study was aimed to know the prevalence of parvovirus infection in dogs in Jabalpur region of Madhya Pradesh.

Materials and methods

The study was conducted on 980 dogs suffering from vomiting and diarrhoea from August 2017 to January 2018 at college of veterinary science and animal husbandary Jabalpur. The dogs were screened by Scan vet Parvo™ kit (Immunochromatographic assay based kit) for the diagnosis of canine parvovirus infection. Age, sex, breed and feeding habits of each dog were recorded to study the prevalence of CPV.

Results

The overall prevalence of CPV infection in dogs was reported as 7.24% (71/980).

Dogs between 0-3 months of age showed the highest

prevalence 11.9% (31/260) followed by 3-6 months of age 7.09% (22 /310) and 6-12 months of age 5.31% (17/320). Whereas, the lowest prevalence of CPV was reported in the dogs above 12 months of age i.e. 1.1% (1/90).

Table 1: Age wise prevalence

S. No.	Age group	No. of dogs examined	CPV positive dogs	Prevalence (%)
1.	0-3 months	260	31	11.9
2.	3-6 months	310	22	7.09
3.	6-12 months	320	17	5.31
4.	Above 12 months	90	1	1.11

Pearson Chi –square value=15.295, DF=3, P-Value=0.002

Sex wise prevalence of canine parvovirus infection

The sex wise prevalence revealed higher prevalence in male (7.91%) as compared to female (6.36%). Non significant correlation was observed in sex wise prevalence of CPV.

Table 2: Sex wise prevalence of canine parvovirus infection

Sex	No. of dogs examined	CPV positive dogs	Prevalence (%)
Male	556	44	7.91
Female	424	27	6.36

Pearson Chi –square value=0.855, DF=1, P-Value=0.355

Breed wise prevalence of canine parvovirus infection

During the present study the dogs of various breeds were examined for CPV infection including Labrador, Spitz, Doberman, Dalmatian, Lhasa apso, German shepherd, Great dane and Non-descript dogs. The maximum prevalence was noticed in non-descript dogs i.e. 12.57% (41/326) followed by Great dane, German shepherd, Spitz, Dalmatian, Labrador, Doberman and Lhasa apso in which prevalence was found to be 10%, 6.12%, 5.26, 3.82%,3.61%, 3.57% and 2.77% respectively.

Table 3: Breed wise prevalence of canine parvovirus infection

S. No.	Breed of dog	No. of dogs examined	CPV positive dogs	Prevalence (%)
1.	Non – descript	326	41	12.57
2.	German shepherd	196	12	6.12
3.	Labrador	235	9	3.82
4.	Lhasa apso	36	1	2.77
5.	Spitz	83	3	3.61
6.	Doberman	56	2	3.57
7.	Great Dane	10	1	10
8.	Dalmatian	38	2	5.26

Prevalence of canine parvovirus infection on the basis of feeding habit

During the present study the dogs reared on vegetarian diet showed significantly higher prevalence i.e. 8.90% (61/685) as compared to dogs reared on non-vegetarian diet i.e. 3.38% (10/295).

Table 4: Prevalence of canine parvovirus infection on the basis of feeding habit

Feeding habit	No. of dogs examined	CPV positive dogs	Prevalence (%)
Vegetarian	685	61	8.90
Non –vegetarian	295	10	3.38

Pearson Chi –square value=9.334, DF=1, P-Value=0.002

Discussion

The overall prevalence of CPV infection was found to be 7.24%. Similar findings were reported by Wazir *et al.* [21] in Jammu who found 6.93% prevalence of CPV infection Nakul [15]. In contrast to the present findings Archana *et al.* [3] and Roy *et al.* [16] reported higher prevalence i.e. 45.30% and 65.04% in Jabalpur and Chhattisgarh respectively. The present findings indicate the presence of CPV in dogs. Immuno-chromatographic assay based kit is useful in supporting the diagnosis and are useful particularly in epidemiological studies. The variation in the prevalence of CPV might be attributed to the fact that diagnostic tests varied between studies. Due to wide variation in the number of samples tested by the different workers in the different geographically area, comparison in this regard would be of little value. However, these variations observed in the prevalence are difficult to explain due to the different study area and difference in the methods of sample analysis.

The age wise prevalence study of CPV infection revealed maximum prevalence in the dogs of 0-3 months of age i.e. 11.9%, followed by 3-6 months of age i.e. 7.09%, 6-12 months of age i.e. 5.31% and above 12 months of age i.e. 1.11%. These observations were in agreement with those of Roy *et al.* [16] Mukhopadhyay *et al.* [14] and Dongre *et al.* [10] who have reported higher prevalence in the dogs of 0-3 month's age; however, Sakulwira *et al.* (2003) and Mosallanejabad *et al.*, [13] reported higher prevalence of CPV infection in 3-6 months old dogs. The higher prevalence in the dogs of 0-3 months of age may be attributed to the higher susceptibility of enterocytes to the viral tropism. Houston *et al.* [11] stated that during weaning, enterocytes of the intestinal crypts have a higher mitotic index because of the changes in bacterial flora and diet and are therefore more susceptible. Thus, the higher prevalence of CPV infection in young dogs (0-3 months) was probably because of close affinity of virus with rapidly dividing cells of the intestine, which decline with the advancement of age Banja *et al.* [5]. Above 1 year age, very less incidence were recorded which might be possible due to develop antibody in the adults either due to vaccination schedule practiced or due to mild exposure to virus leading to build up antibody in the host or some other reasons that need to be explored.

Sex wise prevalence of CPV infection in males and female was 7.91% and 6.36% respectively, suggesting that both the sexes were almost equally affected. These observations are in accordance with those of Deepa *et al.* [8] Castro *et al.* [7] Mosallanejabad *et al.* [13] Archana *et al.* [3] Yang *et al.* [23] however, Tajpara *et al.* [20] Kumar *et al.* [12] Wazir *et al.* [22] Mukhopadhyay *et al.* [15] and Dongre *et al.* [10] reported significant higher prevalence in males as compared with females. Reason behind high incidence in males may be

because most of the admitted dog was male. The high prevalence of CPV in male dogs might be due to more chance of exposure due to certain behavioral pattern and selective preference of keeping male dogs by pet owners Anderson^[1]; Deka *et al.*^[9].

In the present study CPV infection was reported in the various breeds of the dogs including Labrador, Spitz, Doberman, Dalmatian, Lhasa apso, German shepherd, Non-descript dogs and Great dane. The maximum prevalence was noticed in non-descript dogs i.e. 12.57% followed by Great dane, German shepherd, Spitz, Dalmatian, Labrador, Doberman and Lhasa apso in which prevalence was found to be 10%, 6.12%, 5.26, 3.82%, 3.61%, 3.57%, and 2.77% respectively. Higher prevalence in non-descript dogs was also reported by Tajpara *et al.*^[20], Archana *et al.*^[03] and Wazir *et al.*^[22], while, Deepa *et al.*^[8], Sagar *et al.*^[18], Roy *et al.*^[17] and Dongre *et al.*^[10] reported higher prevalence in German shepherd breed of dogs. More prevalence in non-descript breeds might be due to higher population density of this breed making their close proximity to spread the infection or poor vaccination schedule being followed by the owners of non descript breed due to lack of awareness among them. No specific comment can be made on breed susceptibility as the population density of the breed varies from one geographical area to another Archana *et al.*^[3].

During the present study the dogs reared on vegetarian diet showed higher prevalence i.e. 8.90% as compared with 3.38% in dogs reared on non-vegetarian diet. This observation was in accordance with the findings of Sagar *et al.*^[18] and Roy *et al.*^[17].

Conclusion

In the present study the overall prevalence of canine parvovirus infection was 7.24% whereas sex wise prevalence was higher in male than female. Age wise prevalence was found to be maximum (11.9%) in dogs up to 3 months.

Acknowledgement

The authors are thankful to the Dean, College of Veterinary Science And Animal Husbandry Jabalpur for providing necessary funds and facilities to conduct the experiment.

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