Prevalence of Canine Parvo Viral Infection in Dogs In and Around Tirupathi of India

K. Basava Reddy*, B. Shobhamani, B. Sreedevi, D. Rani Prameela and B. Sudhakara Reddy

Department of Veterinary Medicine, College of Veterinary Science, Sri Venkateswara Veterinary University, Tirupathi, Andhra Pradesh, (INDIA)

*Corresponding author: bhavanamvet@gmail.com

Abstract
A total of 217 faecal samples were collected from the dogs suspected for canine parvovirus infection over a period of 6 months from March - August, 2012. The faecal samples were screened by HA, HI tests and Scan Vet™ PARVO kit. Out of 217 dog faecal samples screened, 72 samples were positive for CPV infection with an overall prevalence of 33.17 percent. Breed wise analysis of data indicated that highest prevalence (43.75%) in Spitz and least prevalence (28.71%) in Mongrel. CPV infection in relation to age, was highest (40.74%) in 0-6 months and least (10%) in above 1year old dogs. Sex wise analysis of data revealed the higher prevalence (37.30%) in male dogs than female (27.47%) dogs. Month wise prevalence of CPV infection revealed highest prevalence (48.97%) in the month of July and lowest (20%) in the month of March. The prevalence of CPV infection was high (35.41%) in un-vaccinated dogs than the vaccinated dogs (16.00%).

Key words: Dogs, Prevalence, Tirupati, Canine parvo viral infection

Introduction
Canine parvovirus (CPV) is the most significant viral cause of acute haemorrhagic enteritis and myocarditis in puppies over the age of 3-4 months (Hoelzer and Parrish, 2010). CPV is a single stranded DNA virus and is a major pathogen of dogs. Over a period of time enteric form of disease has predominated and it persists as a major problem in breeding kennels, or where vaccination is widely practiced (Sagazio et al., 1998). The presence of CPV in India has been confirmed by Ramadass and Khader (Ramadass et al., 1982). Strain of CPV present in India has been documented to be CPV 2a (Kumar and Dharmadheeran, 2008). Although the disease is vaccinated against; there is still a chance of vaccine failure amongst pups. Canine parvovirus can affect all dogs, but unvaccinated dogs and puppies younger than four months old are at the most at risk. The virus affects dogs' gastrointestinal tracts and is spread by direct dog-to-dog contact and contact with contaminated stool, environments, or people. The virus can also contaminate kennel surfaces, food and water bowls, collars and leashes, and the hands and clothing of people who handle infected dogs (Reddy et al., 2015). It can be transmitted from place to
place on the hair or feet of dogs or via contaminated cages, shoes, or other objects. The canine parvovirus (CPV) infection is a highly contagious viral illness that affects dogs. Since there was no earlier report on the prevalence of CPV in and around Tirupati, So the present study was undertaken to study the epidemiology of CPV infection.

**Materials and Methods**

Present study was done on the dogs presented to the Teaching Veterinary Clinical Complex, College of Veterinary Science, Tirupati with complaint of diarrhea and vomitions. Detailed history, clinical signs and epidemiological parameters were recorded. Faecal samples were collected into Hiculture Collecting Device (VS). The faecal samples were collected over a period of 6 months from 8th March 2012 to 31st August 2012. Sterile Hiculture Swab was inserted into rectum and collected 1g of faeces and emulsified in 1ml of 0.2M PBS of pH 7.0 for HA test. The swab provided in the Scan Vet™ PARVO kit was used for collection of faeces and processed as per the manufacturer’s instructions.

Canine Parvo Virus Ag Detection Kit (Scan Vet™) PARVO kit was obtained from M/S INTAS Pharmaceuticals Limited Matoda-382210, Ahmedabad, India. Each aecal sample was screened with this test according to the instructions given by the manufacture. Positive case obtain with this test was confirmed with Haemagglutination (HA) and Haemagglutination Inhibition (HI) tests.

**Results and Discussion**

The overall prevalence of CPV infection was calculated based on the results of HA and HI tests. The overall prevalence of CPV infection in the present study was 33.17 percent. Out of 217 dogs tested 72 were positive for CPV antigen. Further, all the 72 dogs had characteristic symptoms, hence all these dogs were considered as clinical cases of canine parvovirus infection. Previously Vasantha Kumari (2011) recorded an overall prevalence of 21.08 percent in Hyderabad. A higher prevalence (53.4%) of CPV in Bhubaneswar city (Banja et al., 2002) and in various parts of Uttarakhand, Uttar Pradesh and Manipur (33.33%) states was recorded (Sanjukta et al., 2011). The reason for the higher prevalence of CPV infection could be either due to delay in vaccination or the dog owners might be unaware of the importance of vaccination.

Breed wise analysis of data indicated that highest prevalence in Spitz (43.75%), followed by Doberman (42.85%), Pomeranian (37.5%), Alsatian (31.03%), Mongrel (28.71%) and other breeds (Pug, Mastiff, Golden retriever, Labrador) (27.77%). (The results are depicted in Fig.1). The present findings are in accordance with the observations of Sagar et al. (2005) who stated that in India canine parvo virus enteritis has got an emerging status, certain breeds like German shepherd, Labrador and spitz are at higher risk of parvo viral enteritis whereas mongrels are less susceptible. Similarly Sanjukta et al. (2011) reported highest prevalence of CPV among Doberman (50%) followed by German shepherd (41.1%).
Spitz (32.5%) and least in Mongrel (19.56%). In the present study lowest prevalence of CPV in Mongrel may be due inherent resistance to the infection.

**Table-1: Age wise prevalence of CPV infection**

<table>
<thead>
<tr>
<th>Age</th>
<th>Number of faecal samples</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tested</td>
<td>Positive</td>
</tr>
<tr>
<td>0-6 months</td>
<td>135</td>
<td>55</td>
</tr>
<tr>
<td>7-12 months</td>
<td>62</td>
<td>15</td>
</tr>
<tr>
<td>Above one year</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>72</td>
</tr>
</tbody>
</table>

**Table-2: Sex wise prevalence of CPV infection**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Number of faecal samples</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tested</td>
<td>Positive</td>
</tr>
<tr>
<td>Male</td>
<td>126</td>
<td>47</td>
</tr>
<tr>
<td>Female</td>
<td>91</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>72</td>
</tr>
</tbody>
</table>

**Table-3: CPV infection in vaccinated verses un-vaccinated dogs**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Number of dogs</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tested</td>
<td>Positives</td>
</tr>
<tr>
<td>Vaccinated dogs</td>
<td>25</td>
<td>4</td>
</tr>
<tr>
<td>Unvaccinated dogs</td>
<td>192</td>
<td>68</td>
</tr>
<tr>
<td>Total</td>
<td>217</td>
<td>72</td>
</tr>
</tbody>
</table>

In the present study, out of 135 faecal samples tested from the age group of 0-6 months, 55 were positive for CPV antigen, whereas 15 out of 62 faecal samples in the age group of 7-12 months and 2 faecal samples out of 20 samples from above 1 year age group were positive for CPV antigen and yielded an age wise prevalence of 40.74, 24.19 and 10 percent respectively. The results are depicted in Table-1 and Fig.2. These findings are in agreement with Baruah et al. (2004). The higher prevalence in younger pups could be due to inadequate innate immunity against virus and the close affinity of CPV for the rapidly dividing cells of the intestine in young animals (Banja et al., 2002). In the present study prevalence was reduced with increase in age. Lowered prevalence in above 1 year dogs may be due to acquired immunity due to constant exposure to field virus.

Out of 126 and 91 male and female dogs tested 47 and 25 were positive with a prevalence of 37.30% and 27.47% respectively. The results are depicted in Table-2 and Fig.3. Sex wise prevalence of CPV revealed higher in male (37.30%) dogs than female (27.47%) dogs. These findings are corroborated with the reports of Phukan et al. (2010). In contrast Banja et al. (2002) reported no influence of sex on incidence of CPV. The high prevalence of CPV in male dogs might be attributed to more chances of exposure to
infection due to their behaviour and selective preference of keeping males as pets by the pet owners (Anderson, 1980).

In the present study, out of 20 dog faecal samples tested in the month of March four were positive for CPV antigen, whereas seven out of 29 faecal samples in April, 9 out of 35 faecal samples in May, 18 out of 52 in June, 24 out of 49 in July and 10 out of 32 in the month of August were positive for CPV antigen with corresponding prevalence of 20, 24.13, 25.71, 34.61, 48.97 and 31.25 percent respectively. The
results are depicted in Fig.4. Month wise prevalence of CPV infection revealed highest prevalence in the month of July (48.97%) followed by June (34.61%), August (31.25%), May (25.71%), April (24.13%) and in March (20%). Whereas Phukan et al. (2010) reported highest prevalence (65.93%) in the month of February.

In the present study out of 25 faecal samples collected from vaccinated dogs four were positive for CPV antigen whereas out of 192 faecal samples collected from un-vaccinated dogs 68 were positive for CPV antigen with corresponding prevalence of 16.00 and 35.41 percent respectively. The results are presented in Table-3 and Fig.5. In the present study out of 25 vaccinated dogs tested 4 (16%) dogs were positive for CPV infection, among them two dogs had improper vaccination schedule, one dog missed booster dose of vaccine and the remaining one dog was regularly vaccinated with multivalent vaccine. Deepa and Saseendranath (2002) also reported vaccination failures in dogs vaccinated with killed or live virus vaccines. The reason for the failure of immune response to vaccine could be due to inadequate repeated boosters of killed vaccine as reported by Hoskins (2006) or due to newly emerging CPV strains (Decaro et al., 2008). In the present study higher prevalence was observed in un-vaccinated (35.41%) dogs than vaccinated (16%) ones. This finding corroborate with the reports of Mohan Raj et al. (2011). Lower prevalence of CPV infection in vaccinated dogs indicated that current vaccines conferred reasonably good protection (Cavalla et al., 2001).

Summary
In the present study, the overall prevalence of CPV was 33.17% in and around Tirupati. Highest prevalence was noticed in Spitz breed than compare with others breeds, dogs between 0-6months age group dogs.

Acknowledgement
Authors are thanking full to the officers of the S.V.V.U for providing the facilities required for the present work. Corresponding author expressed special thanks to the Dr.B.Sudhakara Reddy for his cooperation while writing the articles.

References


