RAPID DETECTION AND SYMPTOMATOLOGY ASSOCIATED WITH CANINE PARVOVIRAL ENTERITIS IN DOGS- A CASE STUDY

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Abstract: Canine parvoviral enteritis is probably one of the most common infectious disorders of dogs throughout the globe and the most prevalent virus responsible for high mortality (in the absence of therapy) in pups with haemorrhagic gastroenteritis. The disease is highly contagious and may be often fatal. Hence, early diagnosis of the infection has utmost importance. In the present study, faecal samples from twenty four pups suspected for canine parvoviral enteritis were tested with sandwich lateral flow immunochromatography assay kit. Out of which fourteen were found to be positive for canine parvoviral (CPV) antigen. Detailed symptomatology was recorded in CPV affected pups (fourteen) which revealed varying degree of severity in the clinical findings. Dullness, anorexia, hematemesis, bloody foul smelling diarrhoea, dehydration and fever were recorded in majority of the patients while some patients had less intense symptoms.

Keywords: Canine parvovirus, dogs, immunochromatography, symptoms

Introduction: Canine parvovirus (CPV) is considered as highly contagious and one of the most significant viral causes for acute haemorrhagic enteritis and myocarditis. This is often fatal, caused by strains of CPV-2 (2a, 2b and 2c) (Greene and Decaro.,2012). Acute CPV-2 enteritis can be seen in dogs of any breed, age, or sex, but puppies between 6 weeks and 6 months are more susceptible (Pollock and Coyne.,1993) whereas myocarditis is very rarely seen unless infection occurs in utero or in puppies less than 8 weeks old born to unvaccinated bitches. "Dull the first day, vomiting on the second, diarrhoea on the third and dead or better on the fourth" neatly sums the clinical features of CPV enteritis (McCandlish.,1998). Besides canine parvovirus, several other pathogens such as coronaviruses, adenoviruses, morbilliviruses, rotaviruses, reoviruses, noroviruses may cause diarrhoea in dogs (Greene and Decaro.,2012). Clinical diagnosis of CPV is indecisive and not definitive (Castro *et al.*, 2007). Therefore, a rapid diagnosis of CPV infection is much important in dog's population to confirm the disease, to isolate the infected dogs and to prevent secondary infections of susceptible contact animals (Decaro and Buonavoglia., 2012, Al- Tayib., 2014). In the present study, sandwich lateral flow immunochromatography assay was employed for the detection of canine parvoviral antigen which yielded rapid and accurate result under field conditions.

Materials and methods: Twenty four patients presented with clinical signs suggestive of canine parvoviral infection such as vomitions, bloody diarrhoea, fever, weakness, inappetence, lethargy etc., were selected for the present study. Faecal samples were collected by inserting sterile swab into the rectum and were tested for CPV antigen with Scan Vet™ PARVO kit (sandwich lateral flow immunochromatography assay kit). Detailed symptomatology was recorded in CPV positive pups.

Results and discussion: Faecal samples from fourteen dogs (58.33 %) were found to be positive for the CPV infection. Positive and negative results with Scanvet™ PARVO kit are depicted in Figure 1**. (A & B).** In the present study, immunochromatography based Scanvet parvoviral antigen detection kit was used which was a rapid, sensitive, simple diagnostic tool (Pillai and Deepa.,2010 and Dongre *et al.*, 2013) and reliable in comparison with molecular methods such as PCR (Mohyedini *et al.*, 2013). Prominent clinical signs noticed were dullness, anorexia, emesis, bloody foul smelling diarrhoea, dehydration and fever. On the day of presentation, all the affected dogs had dullness (100%). Anorexia was present in ten patients (71.43%) and four patients (28.57%) had inappetence. The

prominent clinical sign reported by the owners of patients in the present study was emesis. Vomiting was whitish and watery in four (28.57 %) and three patients (21.43 %) respectively which might be due to absence of bile staining, indicating gastric and, or, salivary secretions as stated by Macartney *et al* (1984). While four patients had haematemesis which might be due to severe haemorrhagic gastritis or regurgitation of haemorrhagic duodenal contents (Balu and Thangaraj., 1981). Destruction and collapse of the germinal epithelium of the intestinal crypts and the resulting villous atrophy was responsible for diarrhoea in all the patients of present study (100 %), which was in accordance with the studies of Greene and Decaro (2012). Bloody diarrhoea reported in eleven patients (78.57 %) might be due to break down of the barrier separating the digestive tract from the blood stream leading to bloody diarrhoea and bacterimia, as also suggested by Nandi and Kumar (2010). Greenish, yellow greyish diarrhoea evinced in three patients (21.43 %) of the present study was supported by the observations of Hoskins (2006). Dehydration was observed as a characteristic clinical sign in the present study and based on skin turgor test it was graded as mild (50 %, 7 pups), moderate (35.71 %, 5 pups) and severe (14.28 %, 2 pups). Large quantity of fluid and protein losses from vomiting and diarrhoea might be responsible for dehydration as stated by Crawford and Sellon.,2010. Previously, dehydration in 72 per cent of CPV cases (Mohan *et al.,* 1993) and moderate to marked dehydration in 72.82 per cent of dogs with parvoviral enteritis (Biswas *et al*., 2005) was documented.

In the present study, the mean rectal temperature of affected dogs (103.86+1.23°F) was significantly elevated when compared to healthy dogs (101.23+0.15°F). However critical examination revealed pyrexia in ten patients and four patients were afebrile. Inflammatory processes in the gastrointestinal system induced by canine parvovirus and concurrent secondary bacterial infection might be responsible for febrile condition in ten patients (71.43 %) in corroboration with the observations of Bhat *et al* (2013) who stated that during the process of inflammation, release of certain inflammatory mediators especially interleukin-1 causes fever along with cachectin, a polypeptide derived from activated macrophages. On auscultation, the mean value of heart rate (132.14+20.82 bpm) was significantly elevated in affected dogs as compared with apparently healthy dogs (103.83+3.83 bpm). On detailed analysis, tachycardia was clearly evinced in eight puppies which might be due to the effect of catecholamine and other compensatory mechanisms of heart to maintain oxygen supply to tissues as suggested by Saxena *et al* (2006). In the present study, death in two pups might be secondary to hypovolemic shock, endotoxemia, and sepsis or as a consequence of systemic inflammatory syndrome (SIRS), as suggested by Mantione and Otto (2005). of the two dead pups, one pup aged 50 days exhibited symptoms of dyspnoea, squealing, crying and retching besides diarrhoea which might be due to CPV myocarditis associated with CPV enteritis (Greene and Decaro., 2012). Eleven patients (78.57%) had normal, fair body condition, while thin body condition was observed in three patients (21.43%). Conjunctival mucous membrane was congested and pale pink in each of the four patients (28.57%) and six cases (42.86%) had normal pink conjunctival mucous membrane.

The variation in the degree of clinical signs may be attributed to one or more of the factors *viz* individual host resistance, virulence of the viral agent, infective dose, existence of diseases and environmental conditions as stated by Glickman *et al* (1985), Hagiwara *et al* (1996) and Banja *et al* (2002).

References:

1. Al-Tayib O 2014 Simple test kit for rapid detection of the presence of canine parvovirus antigen from dog's faeces. Scientific Journal of Veterinary Advances 3(4): 57-64.
2. Balu P A and Thangaraj T M 1981 Canine viral gastroenteritis-A clinical report. Indian Journal of

Veterinary Medicine 1(1): 73-77

3. Banja BK, Sahoo N, Das PK and Ray SK 2002 Clinico-therapeutic aspects of gastroenteritis in dogs. Indian Veterinary Journal 79(8): 837-840
4. Bhat A A, Wadhwa D R and Khan M A 2013 Therapeutic management of canine parvo viral (CPV) gastroenteritis. Veterinary Practitioner 14(1): 96-97.
5. Biswas S, Chakravorty D and Pradhan N R 2005 Clinical and haemato-biochemical changes in parvovirus infection in dogs. Indian Journal of Veterinary Medicine 25(1): 16-18.
6. Castro T X, Cláudia Maria Antunes Uchoa, Maíra Cavalcanti de Albuquerque, Norma Volmer Labarthe, Rita de Cássia N and Cubel Garcia 2007 Canine Parvovirus (CPV) and Intestinal Parasites:Laboratorial Diagnosis and Clinical Signs From Puppies With Gastroenteritis. Intern J Appl Res Vet Med 5(2): 72-76.
7. Crawford P C and Sellon R K 2010 Canine viral diseases. In: Ettinger J S and Feldman E C, Text Book of Veterinary Internal Medicine, W.B. Saunders Company, Philadelphia, pp. 958-962.
8. Decaro N and Buonavoglia C 2012 Canine parvovirus—A review of epidemiological and diagnostic aspects, with emphasis on type 2c.Veterinary Microbiology 155: 1-12.
9. Dongre J, Mehta H K and Maheswari P 2013 Rapid diagnosis and clinical management of canine parvovirus infection Intas polivet 14 (1): 155-156.
10. Glickman LT, Domanski L M, Patronek G J and Visintainer F 1985 Breed related risk factors for canine parvovirus enteritis. Journal of American Veterinary Medical Association 187(6): 589-594.
11. Greene C E and Decaro N 2012 Canine viral enteritis. In: Greene C E, Infectious diseases of the dog and cat, Fourth edition, W.B. Saunders, Elsevier, pp. 67- 74.
12. Hagiwara M K, Mamizuka E M and Pavan-M-de-F B 1996 Role of intestinal flora in acute hemorrhagic gastroenteritis (parvovirus infection) of dogs Brazilian Journal of Veterinary Research and Animal Science 33(2): 107-109.
13. Hoskins J D 2006 Canine viral enteritis. In: Greene C E, Infectious diseases of the Dog and Cat, 3rd edition, W.B. Saunders Co., Phildelphia. pp 40-45.
14. Macartney L, McCandlish I A P and Thomson H 1984 Canine parvovirus enteritis- clinical, haematological and pathological features of experimental infection. Veterinary Record 115(9): 201-210.
15. Mantione N L and Otto C M 2005 Characterization of the use of antiemetic agents in dogs with parvoviral enteritis treated at a veterinary teaching hospital: 77 cases (1997-2000). Journal of the American Veterinary Medical Association 227(11):1787-93.
16. McCandlish I 1998 Canine parvovirus infection. In:Gorman E, Canine Medicine and Therapeutics, fourth edition, Blackwell science limited, pp. 127-130.
17. Mohan R., Nauriyal D C, Singh K B, Mangat A P S and Singh G K 1993 A note on seroprevalence of canine parvo viral infection in Punjab state. Indian Journal of Veterinary Medicine 13(1): 18.
18. Mohyedini Sh, Jamshidi Sh, Rafati S, Nikbakht Gh R, Malmasi A, Taslimi Y and Akbareni H 2013 Comparison of immunochromatographic rapid test with molecular method in diagnosis of canine parvovirus. Iranian journal of veterinary medicine 7(1): 57-61.
19. Nandi S and Kumar M 2010 Canine parvovirus: current perspective. Indian Journal of Virology 21(1): 31-44.
20. Pillai U N and Deepa P M 2010 Rapid diagnosis and treatment of canine parvoviral enteritis. Intas Polivet 11(II): 348-349.
21. Pollock R V H and Coyne M J 1993 Canine parvovirus. Veterinary Clnincs of North America: Small Animal Practice 23(3): 555-568.
22. Saxena R, Dua K, Uppal S K, Saini N and Kumar A 2006 Effect of fluid therapy and lignocaine in management of gasro-enteritis in dogs. Indian Journal of Veterinary Medicine 26(2): 81-85.

A. Positive result B. Negative result

Figure 1.

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