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Clinical Article

THERAPEUTIC MANAGEMENT OF CANINE PARVOVIRUS INFECTION WITH IMMUNOGLOBULIN: A CASE REPORT

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SUMMARY

Canine parvovirus infection is a highly contagious, and potentially fatal viral disease that is a leading cause of death in young and adult dogs. In the present report a five month old dog was presented at Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Odisha University of Agriculture & Technology, Bhubaneswar, Odisha with the history of fever, dehydration, pale mucous membrane, in appetence, yellow colour vomiting, foul smelling bloody diarrhoea, and was extremely lethargic. The observed clinical signs and symptoms indicate a possible parvovirus infection. Based on rapid CPV Ag detection kit, it was confirmed positive for parvovirus and the case was successfully treated with symptomatic and supportive treatment with Canglob-P ® @ 0.4 ml/Kg body weight intravenously for 3 days. The patient recovered successfully after therapy.

Keywords: Canine parvovirus, Immunization, Immunoglobulin, Infection

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Canine parvovirus (CPV) is a single stranded non-enveloped DNA virus belonging to parvoviridae family. The virus can survive for longer duration (months) in the environment under cool moist conditions. Young animals (6 weeks to 6 months, but especially those less than 12 weeks of age) are more likely to develop severe illness and the virus requires mitotically active cells for its replication (Yogesh, 2022). The virus infects all breed of dogs but certain breeds like Rottweilers, Doberman pinschers, and German shepherd are at higher risk of viral infection (Paul *et al.*, 2023). Transmission of parvovirus occurs by faeco-oral or oronasal routes, after exposure to virus in faeces or vomit (Paul *et al.*, 2023, Parrish and Sykes, 2023). The disease has world-wide distribution and is clinically manifested by inappetence, vomiting, dehydration and diarrhoea which is often liquid, foul-smelling and may contain streaks of blood or frank blood (Prabhavathy *et al.*, 2023 and Andrew, 2024). The virus possesses similar attributes of about 98% identical to feline panleukopenia virus, differing only in 6-7 amino acids of the viral capsid protein VP2 (Mittal *et al.*, 2014). Parvovirus infections have high morbidity and mortality rates, but with proper antibiotics, fluid therapy and close monitoring for five days, the infection can be controlled (Chethan *et al.*, 2023).

A 5 Months old male German shepherd dog weighing 4.8 kg was presented at VCC, CVSc. & AH, OUAT, Bhubaneswar, Odisha with the history of fever (103.8° F), inappetence, vomiting, and blood-tinged foetid diarrhoea since last two days (Fig. 1-4). The dog had no history of immunization and deworming. In order to diagnose the dog, physical, haematological, serum biochemical, faecal, and Rapid Immunochromatographic assay examinations were performed Physical Examination revealed dehydration, fever, elevated heart and respiratory rate (Table 1) and hematobiochemical parameters revealed anaemia, thrombocytopenia, hypoglycaemia, hypoalbuminemia and electrolyte imbalance (Table 2-3). On microscopic examination and microbial culture, the faecal samples were found negative for any endoparasite and bacterial pathogen, respectively. Immunochromatographic assay (ICA) was performed using Rapid Test Kit marketed by BIONOTE to quickly examine and detect the CPV Ag (Fig. 5-6).

In absence of antiviral therapy, for treatment of canine parvoviral enteritis fluid therapy and supportive therapy remains the cornerstone. In the present case the patient was treated with a passive immunization of dogs against parvovirus by Canglob- P® at the dose of 0.4 ml/Kg body weight intravenously daily for 3 days (Rishikesavan *et al.*, 2021). Besides Ringer's lactate @ 200 ml, BID I/V for 5 days, Vetplasma injection @ 10-20ml/kg b.wt. BID I/V for 5 days, Ceftriaxone and Tazobactum @ 20 mg/kg b.wt. BID I/V for 5 days, Pantoprazole @ 0.7-1 mg/kg b.wt. IV q 24 h for 5 days, Metronidazole @ 20mg/kg b.wt. IV daily for 5 days, Ondansetron 0.1-0.5 mg/kg b.wt. Slow IV q 6-12 hr for 5 days, Vitamin K: @ 0.5 ml I/V single dose, Etamsylate @ 6.25-12.5 mg/kg body weight daily I/M for 5 days. After adjunct immunoglobulin therapy, patient recovered completely and the hematobio-chemical parameters were within normal range. There are currently three widely recognised strains of canine

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Fig. 1. Yellowish mucoid vomiting

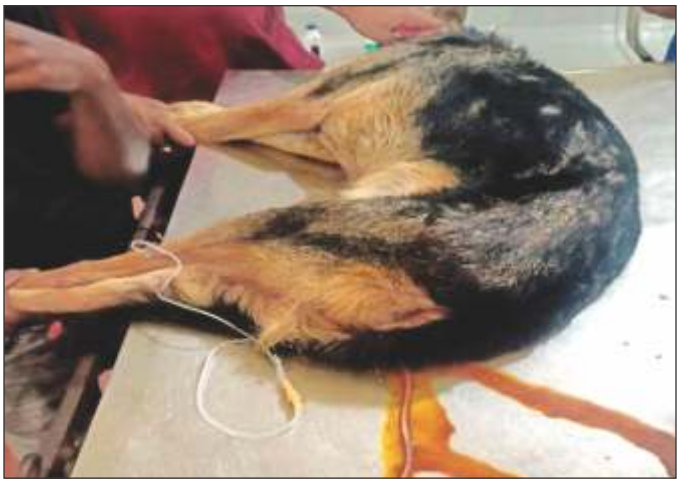
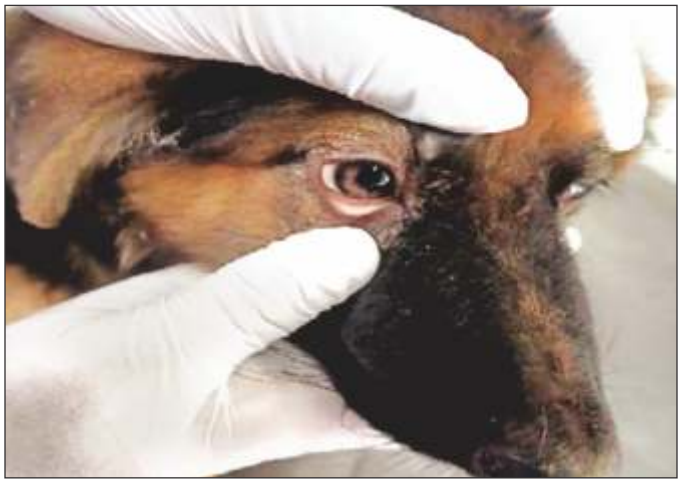
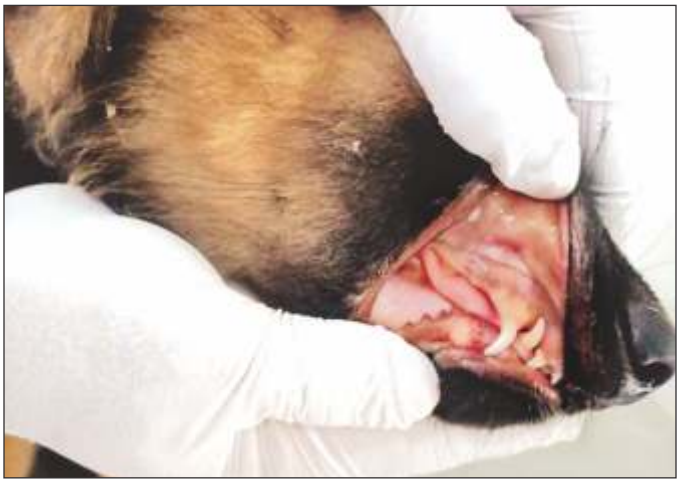


Fig. 2. Blood-tinged foul-smelling diarrhoea





Figs. 3 and 4. Pale conjunctival and oral mucous membranes

Faecal Examination

Test Procedure:

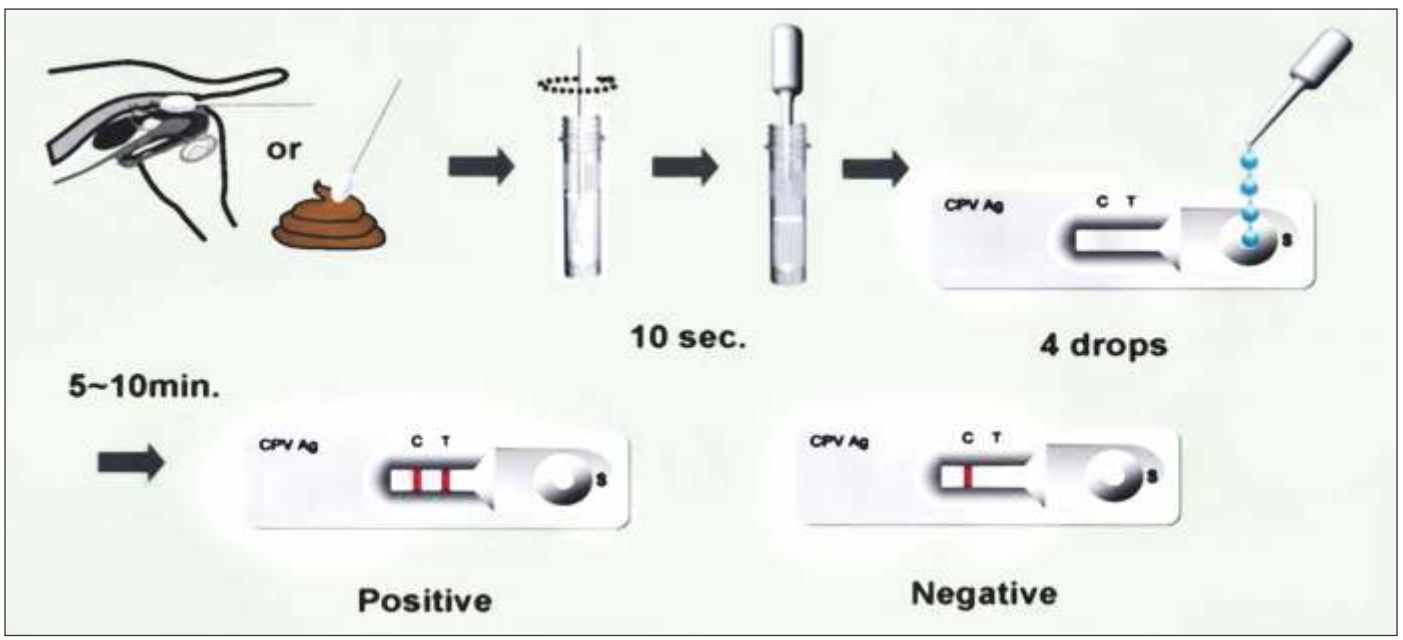


Fig. 5. Test Procedure on Rapid Test Kit (Source: Dan Scott and Associates)

Table 1. Physical Examination

Parameter	Result	Normal Reference Range
Mucous Membrane	Pale	Pink
Capillary Refill Time (CRT)	>3 second	1-2 second
Dehydration	Moderate (6-8%), Retention of skin fold/sec.: 4 second	Normal Range within 2 second
Rectal Temperature	103.8° F	102° F (38.9° C)
Heart Rate	135 beats per minutes	70-120 beats per minutes
Respiratory Rate	38 breaths per minute	18-34 breaths per minute

Table 2. Haematological Examination

Parameter		0 Day	5thDay	Normal Reference Range
Hb (gm%)		5.8	13.2	11.9-18.9
TLC (/µl)		16200	10800	5.0-14.1
DLC	Neutrophil (%)	79	68	58-85
	Lymphocyte (%)	19	26	8-21
	Monocyte (%)	01	4	2-10
	Eosinophil (%)	01	2	0-9
	Basophil (%)	00	00	0-1
PLT (105/µl)		2.1	4.82	2.11-6.21
PCV (%)		18	48	35-57
TEC (Million /µl)		2.74	5.94	4.95-7.87

Table 3. Serum Biochemical Examination

Parameter	0 Day	5th Day	Normal Reference Range
Glucose	55 mg/dl	80 mg/dl	76-119 mg/dl
Albumin	1.4 mg/dl	2.6 mg/dl	2.3-3.1 mg/dl
ALT	55 U/L	46 U/L	10-109 U/L
Sodium	115 mEq/L	147 mEq/L	142-152 mEq/L
Chloride	90 mEq/L	105 mEq/L	110-124 mEq/L
Total Bilirubin	2.0 mg/dl	0.48 mEq/L	0.1-0.5 mg/dl
Creatinine	0.34 mg/dl	0.25 mg/dl	0.5-1.7 mg/dl

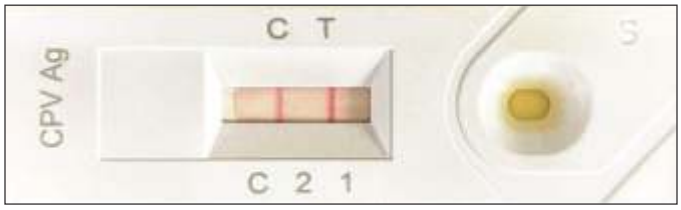


Fig. 6. CPV Test Kit showing CPV positive

parvovirus: CPV-2a, CPV-2b and CPV-2c (Ogbu *et al.*, 2017). Hypoproteinemia, hypoalbuminemia and severe anaemia is noticed in canine parvoviral gastroenteritis caused by blood and serum protein leaking through the injured intestinal villi's capillaries or by decreased protein absorption through the damaged villi (Chethan ET AL., 2023, Paul *et al.*, 2023). Antibiotics and fluid therapy were administered to control secondary bacterial infection, restore acid-base and electrolyte balance and maintain dog's hydration status (Mylonakis *et al.*, 2016). The development of passive immunity in the host relies on the administration route, the amount of immunoglobulin given and the frequency of immunoglobulin doses. Passive immunity is induced more rapidly with intravenous (IV) administration compared to intramuscular or subcutaneous routes. After fivedays posttreatment, blood sample was taken, and hematobiochemical parameters analyses revealed normal values. To prevent CPV-2 (canine parvovirus type 2), puppies should be immunized with a series of initial vaccinations given every 3 to 4 weeks, starting at 6 to 8 weeks of age. This series should continue until the puppy is at least 14 to 16 weeks old, as maternal antibodies present in some puppies may interfere with vaccine effectiveness until 16 to 20 weeks of age. After this series, a booster should be given at 6 months or 1 year of age, followed by additional doses every 3 years (Parrish and Sykes, 2023). Hence from the present case study it could be concluded that immunotherapy is one of the better options for effective treatment of CPV infection in dogs.

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