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Concurrent canine parvoviral enteritis and *Isospora* infection in a German Shepherd puppy: Clinical, coprological and molecular diagnosis

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Abstract

A 3-month-old male German Shepherd puppy was presented with inappetence, vomiting and acute onset of bloody, foul-smelling diarrhoea. Clinical examination revealed dullness, pale conjunctival mucous membranes, severe dehydration, pyrexia and tensed abdomen. Faecal antigen rapid test was positive for canine parvoviral enteritis, while coprological examination revealed *Isospora* spp. oocysts. Molecular confirmation by PCR amplified a 400 bp fragment specific for canine parvovirus. The puppy was treated with intensive supportive therapy including intravenous fluids, antibiotics, antiemetics, gastric protectants and anticoccidial drugs for five days. Gradual clinical and haematological improvement was observed with resolution of vomiting and diarrhoea. The case highlights the importance of early diagnosis, molecular confirmation and aggressive supportive management in canine parvoviral enteritis complicated by concurrent *Isospora* infection.

Keywords: Canine parvoviral enteritis, *Isospora* spp., PCR diagnosis, diarrhoea

Introduction

Canine parvoviral enteritis (CPE) is a highly contagious viral gastroenteritis of domestic dogs caused by canine parvovirus type 2 (CPV-2), characterized by acute haemorrhagic diarrhoea, vomiting, dehydration, leukopenia and significant mortality in young and unvaccinated puppies. CPV predominantly affects the rapidly dividing cells of the intestinal crypts and bone marrow, resulting in severe enteric pathology and systemic compromise (Abhiram *et al.*, 2023) [1]. In India, CPV continues to be a major cause of canine morbidity and mortality. Epidemiological surveys report high prevalence of CPV infection in diarrhoeic dogs, with PCR incidence rates commonly above 30-40% in clinically suspected cases (Abhiram *et al.*, 2023) [2]. In a PCR-based study from Kolkata, nearly one-third of faecal samples from diarrhoeic dogs tested positive for CPV-2 with the highest occurrence in puppies aged 1-6 months. Likewise, a regional study around Tirupati detected CPV infection in approximately 40.25% of diarrhoeic dogs, with the youngest age groups (<3 months) most frequently affected (Mohan *et al.*, 2025) [2]. Concurrent intestinal parasitism, such as coccidial infections (*Isospora* spp.) may further exacerbate gastrointestinal pathology and hinder recovery in affected puppies, yet reports on mixed infections in Indian canine populations remain limited. This case report details the concurrent infection of parvoviral enteritis and Isosporosis in a German Shepherd puppy.

Case history and observation

A 3-month-old male German Shepherd puppy weighing 5.3 kg was presented to the Veterinary Clinical Complex, Veterinary College and Research Institute, Orathanadu with a history of inappetence, repeated vomiting and acute onset of bloody, foul-smelling diarrhoea for the past two days. The owner reported progressive weakness and recumbency prior to presentation. On clinical examination, the animal appeared poor in general condition and was dull and depressed. The conjunctival mucous membranes were pale, indicating compromised perfusion. Severe dehydration was evident, as assessed by prolonged capillary refill time (>4 seconds) and delayed skin tenting (>3 seconds). Physiological parameters revealed a heart rate of

120 beats/min, respiratory rate of 50 breaths/min and rectal temperature of 39.6 °C. Abdominal palpation revealed a tensed abdome, and tenesmus was observed during defecation. The faeces were bloody, foul smelling and watery in consistency. For laboratory confirmation, blood and faecal samples were collected aseptically prior to initiation of therapy. Whole blood was collected from the cephalic vein into EDTA vacutainers for haematological examination. Fresh faecal material was collected directly from the rectum using sterile gloves and containers for coprological examination and further diagnostic testing. Initial screening using a canine parvovirus enteritis (CPE) antigen rapid test performed on the faecal sample yielded a positive result indicating active parvoviral infection (Fig. 1). Coprological examination of the faecal sample revealed the presence of *Isospora* spp. oocysts (Fig. 2) suggestive of concurrent coccidial infection. For molecular confirmation, DNA was extracted from the faecal sample and subjected to polymerase chain reaction (PCR) analysis. The PCR assay amplified a specific 400 bp fragment (Fig. 3) confirming the presence of canine parvovirus (parvoviral enteritis). These findings established a diagnosis of canine parvoviral enteritis complicated by concurrent *Isospora* infection.

Treatment and result

Based on the clinical severity, positive antigen and molecular confirmation of canine parvoviral enteritis and concurrent *Isospora* infection an intensive supportive and symptomatic treatment regimen was instituted and continued for five

consecutive days. Fluid therapy was initiated using dextrose normal saline (DNS) and Ringer's lactate (RL) administered intravenously at 50 ml each to correct severe dehydration and electrolyte imbalance. Broad-spectrum antimicrobial coverage was provided with ceftriaxone @ 20 mg/kg IV to prevent secondary bacterial septicaemia. Metronidazole @ 25 mg/kg IV was administered to control anaerobic bacterial overgrowth. To manage vomiting and gastric irritation, ondansetron @ 0.2 mg/kg IV and ranitidine @ 2 mg/kg IM were administered. Considering the detection of *Isospora* spp. oocysts, sulphonamide-trimethoprim combination @ 15 mg/kg IM was included for anticoccidial therapy. Tribivet® (vitamin B1, B6 and B12) @ 2 ml IV was given as supportive therapy to improve appetite and metabolic recovery. The puppy showed a gradual and consistent clinical improvement following initiation of therapy. Vomiting subsided by the second day of treatment and the frequency and severity of diarrhoea reduced progressively, with marked improvement in faecal consistency by day four. Appetite improved gradually and the animal regained alertness and normal posture. Serial haematological evaluation revealed a progressive improvement in haemoglobin, packed cell volume, and erythrocyte count indicating correction of dehydration and haemoconcentration. Leukocytosis observed on day one ($17 \times 10^3/\mu\text{L}$) gradually returned towards normal limits by day four ($9.5 \times 10^3/\mu\text{L}$). Differential leukocyte counts showed partial recovery of neutrophil counts with a relative decrease in lymphocytosis over the observation period.

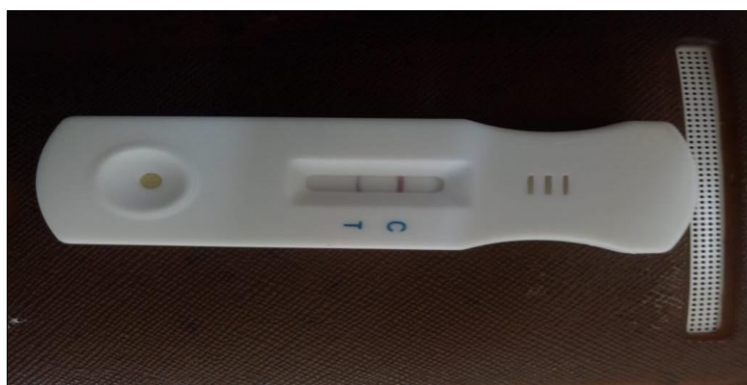


Fig 1: Canine parvovirus enteritis (CPE) antigen rapid test performed on faecal sample showing a positive result with distinct control (C) and test (T) lines.



Fig 2: Unsporulated oocyst of *Isospora* spp. in the faecal sample

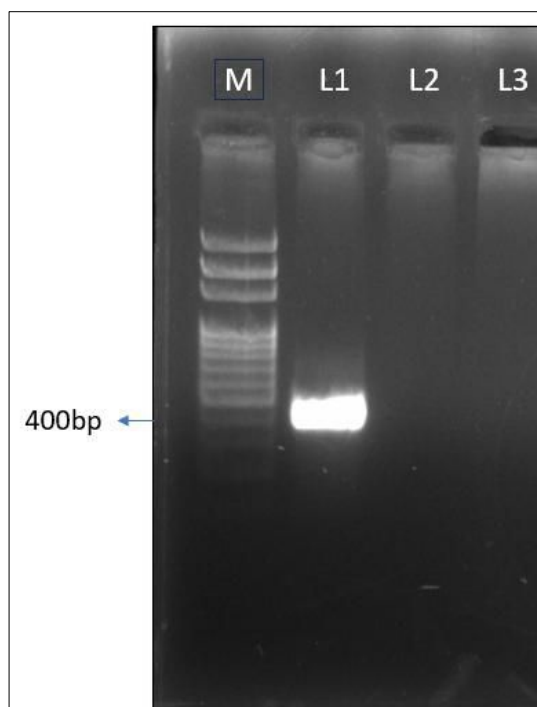


Fig 3: Agarose gel electrophoresis of PCR amplicons for canine parvovirus, showing a specific ~400 bp product. Lane M: DNA molecular weight marker; Lane L1: positive sample with ~400 bp amplicon; Lanes L2 and L3: negative samples with no detectable amplification.

Discussion

Canine parvoviral enteritis (CPE) is recognized as one of the most significant causes of acute haemorrhagic gastroenteritis in young dogs across India, particularly in unvaccinated pups under six months of age. Several Indian studies have consistently demonstrated high prevalence of CPE in this age group with clinical presentations (Mohan *et al.*, 2025) [2] similar to those in the present case. The hallmark features of CPE include haemorrhagic, foul-smelling diarrhoea, severe dehydration, vomiting and profound depression which were well documented in Indian veterinary scenario (Sharma, 2025) [4]. In a field study using rapid antigen kits in Central India, vomiting and severe dehydration were reported (Mandawat *et al.*, 2025) [3] in the majority of confirmed CPV cases reinforcing the typical clinical picture seen in this case. Haematological alterations in CPE commonly include leukocytosis or leukopenia depending on disease stage and secondary complications. Studies from India have documented significant changes in total leukocyte and differential counts in parvoviral cases (Zope *et al.*, 2023) [5], similar to the elevated WBC with lymphocytosis and depressed neutrophil proportions observed early in treatment in the present report. Such patterns reflect the immune response to viral enteritis and secondary bacterial translocation and septicaemia which often complicates clinical recovery.

While parvovirus alone can produce severe gastroenteritis, concurrent infections with intestinal parasites such as *Isospora* are not uncommon in field settings, especially in young, unvaccinated animals exposed to environmental contamination (Baghel *et al.*, 2024) [6]. Therapeutic management emphasizing aggressive fluid therapy, antiemetics, broad-spectrum antimicrobials and correction of electrolyte imbalance remain the cornerstone of CPE treatment, as reported in multiple Indian clinical studies (Shruthi and Ajay, 2023; Sharma, 2025) [4, 7]. The gradual clinical and hematologic improvement seen over the treatment period in this case mirrors findings which correlate early supportive care with higher survival rates in infected pups. In summary, the clinical course, diagnostic results and

therapeutic response in this case are consistent with canine parvoviral enteritis. The additional detection of *Isospora* spp. highlights the importance of comprehensive fecal screening in diarrhoeic puppies, particularly in regions where environmental contamination is a significant risk factor.

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