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CLINICAL MANAGEMENT OF CANINE PARVOVIRAL ENTERITIS IN A 3-MONTH-OLD LHASA APSO IN ABUJA, FCT, NIGERIA

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ABSTRACT

Canine parvovirus (CPV) is a highly contagious, non-enveloped, single-stranded DNA virus of the *Parvoviridae* family that primarily affects rapidly dividing cells in the intestinal crypts and bone marrow of dogs. This report describes the clinical presentation and successful management of a 3-month-old female Lhasa Apso puppy presented to the Police Veterinary Hospital, Garki, Abuja, with hemorrhagic diarrhea and frothy vomiting. Diagnosis was confirmed using a rapid parvoviral antigen test kit. Hematological findings revealed leukocytosis (18.0×10^9/L) and lymphocytosis (7.3×10^9/L), suggestive of a viral infection. The treatment protocol included fluid therapy, antimicrobial coverage, antiemetics, vitamins, activated charcoal, and oral protectants. Clinical improvement was observed within five days of intensive management, with full recovery and discharge on day five. This case underscores the importance of early diagnosis, aggressive supportive therapy, and strict adherence to vaccination schedules for effective prevention of parvoviral enteritis in puppies.

Keywords: Canine parvovirus, Enteritis, Management, Puppy, Abuja

INTRODUCTION

Canine parvoviral enteritis (CPVE) continues to be a significant cause of morbidity and mortality in young dogs globally. The etiologic agent, the Canine parvovirus type 2 (CPV-2), is a small, non-enveloped single-stranded DNA virus of the family *Parvoviridae*, genus Protoparvovirus 1. It preferentially infects rapidly dividing cells in the intestinal crypt epithelium and bone marrow, leading to profound enteritis and immunosuppression (Steinel et al., 1998; Decaro *et al*., 2007). Since its emergence in the late 1970s, CPV-2 has given rise to antigenic variants (e.g., CPV-2a, 2b, 2c) by accumulating mutations in the VP2 capsid protein, thereby altering host range, antigenicity and possibly vaccine efficacy (Parrish *et al*., 1991; Hoelzer & Parrish, 2010; Pan *et al*., 2024). Recent molecular investigations demonstrate that CPV-2c is increasingly predominant in canine populations, including in Africa, and may be associated with breakthrough infections in vaccinated dogs (Umar *et al*., 2024; Adeyemo *et al*., 2024; Pan *et al*., 2024).

Transmission of CPV is primarily through the faecal-oral route or contaminated fomites, with the virus persisting in the environment and being highly resistant to many disinfectants (Pollock & Carmichael, 1982; Decaro *et al*., 2005). Puppies between six and twenty weeks of age are particularly at risk during the period of maternal antibody waning, which underscores the importance of early vaccination and bio-security measures (Hoskins, 1998). In Nigeria, molecular epidemiological data show circulation of all three major variants (CPV-2a, 2b and 2c), with an upsurge in CPV-2c being noted in recent years, posing additional challenges for disease control (Adeyemo *et al*., 2024; Adeyemo *et al*., 2024). Despite the availability of effective vaccines, CPVE remains a major problem in many regions, especially in settings where vaccination coverage, sanitation and veterinary resources are limited. The clinical outcome in affected puppies depends largely on rapid diagnosis, aggressive supportive care and prevention of secondary complications (Prittie, 2004). This case report presents the clinical management of CPVE in a 3-month-old Lhasa Apso puppy in Abuja, Nigeria, with detailed diagnostic findings, therapeutic interventions and outcome. The aim is to highlight both the opportunities and challenges of CPVE management in a Nigerian veterinary practice setting.

MATERIALS AND METHODS

Case Presentation

On 28 May 2025, a 3-month-old female Lhasa Apso weighing 3 kg was presented to the Police Veterinary Hospital, Garki, Abuja, with a history of hemorrhagic diarrhea and white frothy vomiting. The puppy had been acquired two weeks earlier and had no record of vaccination or deworming.

On physical examination, the puppy was lethargic and dehydrated. The ocular and oral mucous membranes were pink. Bloody, foul-smelling feces were observed in the cage and around the anal region. No ectoparasites were found. Differential diagnoses included parvoviral enteritis, hemorrhagic gastroenteritis, canine distemper, and poisoning. Based on clinical presentation, parvoviral enteritis was tentatively diagnosed.

Table 1: Vital Parameters

Parameters	Results	*Reference Range	Remark
Temperature (°C)	39.5	37.5-39.5	High
Pulse rate (beats/minute)	82	65-90	Normal
Capillary refill time (Seconds)	2	1-2	Normal
Respiratory rate (cycles/minute)	29	15-30	Normal

*Source: Fielder (2015)

RESULTS AND DISCUSSION

Diagnostic and Clinical Assessment

Fecal and blood samples were collected for confirmatory diagnosis and clinical evaluation. A rapid immunochromatographic test kit (Pet Care® CPV Antigen Test Kit, USA) was employed for the detection of Canine parvovirus antigen in fecal material, following the manufacturer's instructions. Approximately 1 g of fecal sample was mixed thoroughly with the provided diluent, and three drops of the suspension were applied to the sample well of the test cassette. Results were read after 5 minutes. The appearance of both control and test lines was interpreted as positive for Canine parvovirus antigen (Plate 1).

Whole blood was collected aseptically from the cephalic vein into ethylenediaminetetraacetic acid (EDTA) tubes and submitted to the Police Veterinary Hospital, Garki, Abuja, diagnostic laboratory for hematological evaluation (Table 2).

Table 2: Hematology Results

Parameter	Result	Reference Range	Interpretation
PCV%	38.1	37.0 – 55.0	Normal
Hb (g/dl)	12.0	12.0 – 18.0	Normal
RBC ($\times10^{12}$/L)	6.35	5.5 – 8.5	Normal
MCV (fl)	66.0	66.0 – 77.0	Normal
MCH (pg)	18.5	19.5 – 24.5	Low
MCHC(g/dl)	31.0	31.0 – 36.0	Normal
WBC($\times10^{9}$/L)	18.0	4.0 – 17.0	High
Neutrophil($\times10^{9}$/L)	10.0	2.9 – 12.0	Normal
Lymphocyte($\times10^{9}$/L)	7.3	0.7 – 5.1	High
Eosinophils ($\times10^{9}$/L)	0.3	O – 1.3	Normal
Monocytes($\times10^{9}$/L)	0	0.1 – 0.4	Normal
Basophils ($\times10^{9}$/L)	0.4	0 – 1.0	Normal
Platelets ($\times10^{9}$/L)	222	200 – 500	Normal

Keys: *Hb = Hemoglobin; RBC = Red blood cell count; MCV = Mean corpuscular volume; MCH = Mean corpuscular hemoglobin; MCHC = Mean corpuscular hemoglobin concentration; PCV= Packed cell volume; WBC = White blood cell count; fl= femtoliter; g/dl=grams per deciliter; L= litre; pg= picograms*

Source: Police veterinary hospital, Garki, Abuja

Interpretation

The erythrogram and thrombogram were within normal limits, while the leukogram showed leukocytosis due to lymphocytosis, suggestive of viral infection. A rapid parvoviral antigen test confirmed canine parvoviral enteritis.

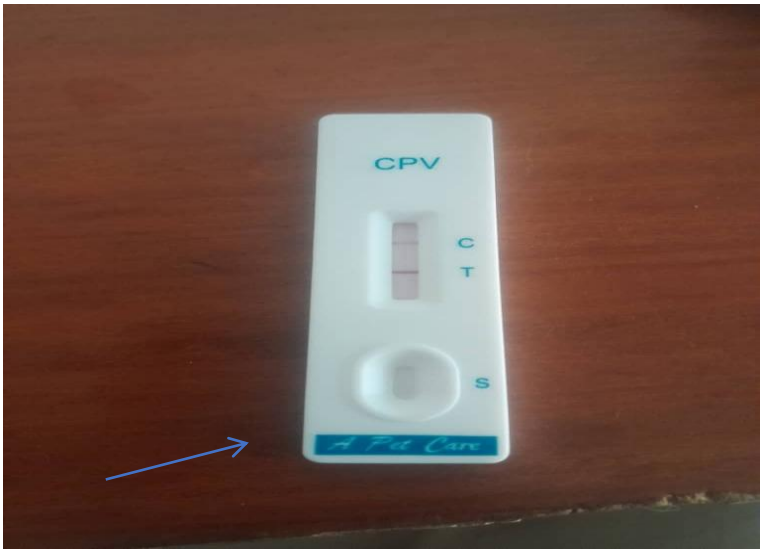

Plate 1: Positive Result of the Canine Parvovirus Rapid Antigen Test (Pet Care®, USA), Indicating the Presence of CPV Antigen in the Fecal Sample

Therapeutic Intervention

The puppy received intensive supportive care as follows:

i. 5% Dextrose saline: 90 mL IV SID for 3 days to correct dehydration and maintain electrolyte balance.
ii. Metronidazole (0.5%): 15 mg/kg IV BID for 5 days as an antimicrobial and anti-protozoal agent.
iii. Ondansetron (0.5%): 1 mg/kg IM SID for 3 days to control emesis.
iv. Ceftriaxone (10%): 20 mg/kg IV SID for 5 days for broad-spectrum bacterial coverage.
v. Vitamin B-complex: 0.5 mL IM SID for 5 days to support recovery.
vi. Kaolin–pectin suspension (DiaStop®): 1 mL/kg PO TID for 3 days to protect the intestinal mucosa.
vii. Activated charcoal: 1 g/kg PO single dose to adsorb intestinal toxins

The puppy was isolated and monitored daily.

Outcome and Follow-Up

Clinical progress was monitored over five days, as shown.

Table 3: Follow Up Observations

Date	Vital Parameters	Treatment	Remark
29thMay, 2025	Normal	As prescribed.	Patient was weak and lethargic, diarrhea was bloody and foul smelling, Vomiting occurred after oral administration of DiaStop®.
30th May 2025	Normal	As prescribed.	Patient was active, Foul smelling diarrhea persisted
31stMay 2025	Normal	As prescribed.	Patient was active, no vomiting, watery diarrhea present.
1st June 2025	Normal	As prescribed.	Patient was active with improved appetite.
2nd June 2025	Normal	As prescribed.	Patient was active with good appetite, feces firmed and the patient was discharged same day

By the fifth day, all clinical signs had resolved, and the puppy was discharged with dietary advice and follow-up vaccination scheduled after full recovery

Discussion

By the fifth day, all clinical signs had resolved, and the puppy was discharged with dietary advice and follow-up vaccination scheduled after full recovery

Canine parvoviral enteritis (CPVE) remains one of the most devastating and widely reported infectious diseases in young dogs globally, particularly among unvaccinated populations. The disease is characterized by acute onset of vomiting, hemorrhagic diarrhea, dehydration, and high mortality when untreated (Steinel *et al*., 1998; Decaro et al., 2007). In a retrospective shelter study, Keegan et al. (2020) reported an overall survival rate of 86.6%, which increased to 96.7% after five days of hospitalization, emphasizing the importance of rapid clinical intervention. Similarly, recent reviews indicate that while untreated mortality can approach 91%, early aggressive supportive therapy can reduce fatality to less than 20% (Prittie, 2004; Veterinary Times, 2024).

Clinical presentation and diagnostic observations

The clinical features in this report, acute vomiting, foul-smelling hemorrhagic diarrhea, lethargy, and dehydration, are consistent with the classical presentation of CPVE described in recent epidemiological surveys (Yilmaz *et al*., 2005; Shruti & Ajay, 2023). Hematological evaluation revealed lymphocytosis and leukocytosis, a finding that contrasts with the leukopenia often observed in severe or terminal cases (Decaro *et al*., 2007; Zope *et al*., 2023). This discrepancy may be attributed to early-stage detection and prompt initiation of treatment before significant viral-induced myelosuppression occurred. Differences in CPV strain virulence, immune response, and host factors such as breed and nutritional status may also explain variable hematologic responses (Zope *et al*., 2023).

Therapeutic intervention and outcome

The therapeutic regimen, comprising aggressive fluid therapy, broad-spectrum antimicrobials, antiemetics, vitamin supplementation, and intestinal protectants, proved effective, as the patient recovered fully within five days. This management protocol aligns with established best practices that advocate fluid resuscitation, antiemetic therapy, and prophylactic antibiotic use to prevent secondary bacterial translocation (Prittie, 2004; Shruti & Ajay, 2023). The successful outcome observed in this case mirrors findings from Keegan *et al*. (2020), who demonstrated that early presentation, isolation, and consistent monitoring significantly improve survival.

Novel approaches are emerging, including monoclonal antibody therapies that target the CPV capsid, achieving survival rates exceeding 90% in field trials (Elanco, 2024). However, accessibility and cost remain limiting factors in many developing countries, including Nigeria. Consequently, conventional supportive therapy remains the mainstay of treatment and can still yield favorable results when implemented early and consistently.

Public health and epidemiological implications

This case underscores the persistent threat of CPV in Nigeria and similar regions where vaccine coverage and biosecurity practices are suboptimal. The patient in this report was unvaccinated and recently acquired, two major risk factors for CPVE. Recent surveillance data in Nigeria have detected multiple co-circulating variants (CPV-2a, 2b, and 2c), with CPV-2c showing increasing prevalence and possible association with vaccine breakthroughs (Adeyemo *et al*., 2024; Umar *et al*., 2024). Comparable trends have been reported globally, highlighting the virus's ongoing evolution and the need for vaccine updates (Pan *et al*., 2024).

Local evidence continues to support the efficacy of early treatment in improving survival even in resource-limited settings. Ahmed *et al.* (2021) observed that 87% of dogs presenting with CPVE in their cohort recovered following prompt supportive care. The outcome in the present case, achieved through basic but timely management, reinforces the critical role of early diagnosis, rapid fluid correction, and diligent monitoring.

Limitations and future perspectives

This report is limited by the absence of molecular typing to determine the viral strain involved. Genetic characterization would enhance understanding of local epidemiology and potential vaccine escape patterns. Long-term follow-up beyond discharge was also not performed. Thus, chronic sequelae such as malabsorption or intestinal fibrosis could not

be evaluated. Future case series should integrate molecular diagnostics, treatment cost analysis, and long-term outcomes to provide a holistic perspective on canine parvoviral enteritis management in Nigeria.

CONCLUSION

This case demonstrates that early diagnosis and prompt institution of supportive therapy can achieve recovery rates comparable to international standards, even in low-resource clinical settings. Sustained efforts in public education, routine vaccination, and hygiene practices remain essential to curb the continued impact of canine parvoviral enteritis among young dogs in Nigeria and beyond.

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