

Research Article

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## Clinico - Haematobiochemical changes in Canine Parvoviral infection

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### Keywords

Microcytic  
hypochromic anaemia,  
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parvovirus,  
biochemical changes.

### Abstract

In the present study, three cases of canine parvovirus (CPV) were diagnosed. History revealed that all the dogs were unvaccinated. The clinical signs observed were depression, anorexia, frothy vomitus and foul smelling bloody diarrhoea. Hematology revealed microcytic hypochromic non-regenerative anemia, lymphopenia, leukopenia and thrombocytopenia. The levels of alkaline phosphatase (ALP) and alanine amino transferase (ALT) were elevated while the total protein (TP) and albumin levels were decreased.

### Introduction

During last three decades, canine parvovirus infection (CPV) has emerged as a major cause of gastroenteritis in dogs in many parts of the world (Carmichael, 2005). Acute enteritis is the most common manifestation of the disease and is mostly seen in puppies up to 6 months of age. Initial clinical signs are non specific and include anorexia, depression, lethargy and fever. On later stages, typical signs include vomiting and diarrhea that can range from mucoid to hemorrhagic. Factors that predispose to parvoviral infection in puppies are lack of protective immunity, intestinal parasites, overcrowding, unsanitary and stressful environmental conditions (Lamm and Rezabek, 2008). The present study is about clinico - hematobiochemical alterations in two parvoviral infected dogs.

### Materials and Methods

Three dogs were presented to Veterinary Dispensary, Kadapa district with the history of frothy vomitions and foul smelling bloody diarrhoea. For haematological

studies 4 – 5 ml of blood was collected in EDTA vacutainers aseptically from jugular vein. Total leucocyte count was estimated manually by using haemocytometer. The differential leucocyte count was performed manually on blood smear stained by Giemsa staining method. For serum samples, 2- 3 ml of blood was collected separately in a dry, clean and sterilized test tube and allowed to clot. Serum sample was preserved at -20° C. Serum concentrations of alanine amino transferase (ALT), alkaline phosphatase (ALP), total protein and albumin were determined by semi-automated clinical chemistry analyzer.

### Results

A total of three cases of canine parvovirus were diagnosed in the present report. The clinical signs observed were depression, anorexia, frothy vomitus (Fig. 1) and foul smelling bloody diarrhoea (Fig. 2 & 3). All the dogs were unvaccinated against parvovirus. Hematology revealed anemia (PCV 24± 1.23%),

haemoglobin ( $8 \pm 0.52$  g/dl), leucopenia ( $26.40 \pm 3.42 \times 10^3/\mu\text{l}$ ), lymphocytopenia ( $14 \pm 1.42\%$ ) and thrombocytopenia ( $98 \pm 2.25 \times 10^3/\mu\text{l}$ ). The anemia was of moderate type, microcytic hypochromic and non-

regenerative. Serum biochemistry revealed elevated ALP ( $140 \pm 14.52$  IU/L) and ALT ( $148 \pm 6.98$  IU/L). Total protein ( $4.58 \pm 0.54$  g/dl) and albumin ( $2.54 \pm 0.48$  g/dl) levels were decreased.



**Fig. 1** Parvo viral dog showing frothy vomitus



**Fig. 2** Parvo viral dog showing bloody diarrhoea



**Fig. 3** Parvo viral dog showing bloody diarrhoea

## Discussion

Acute enteritis is the most common manifestation of the CPV infection and is mostly seen in puppies up to 6 months of age. Anemia, leucocytopenia, neutropenia and thrombocytopenia observed in the present study were also reported by Weiss et al. (1999). This is because the virus affects bone marrow and is cytotoxic for hematopoietic cells leading to myeloid and erythroid hypoplasia during acute stages of the disease. As the animal recovers from parvovirus infection, neutrophilia in peripheral blood, hyperplasia of the lymphoid, erythroid and myeloid cells are restored (Macintire and Smith, 1997). The hematological changes are due to destruction of hematopoietic progenitor cells of the various leukocyte types in the bone marrow and other lymphoproliferative organs such as the thymus, lymph nodes, and spleen. This process results in inadequate supply for the massive demand for leukocytes (specifically neutrophils) in the inflamed gastrointestinal tract. (Macartney et al. 1984 and Goddard et al. 2008). Elevation in alkaline phosphatase and alanine transaminase may occur as a result of hepatic hypoxia secondary to severe hypovolemia or the absorption of toxic substances due to loss of the gut barrier. Elevated alkaline phosphatase activity can also be associated with young age (Jacobs et al. 1980)

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