

EPIDEMIOLOGICAL STUDY OF PARVO GASTROENTERITIS AND ITS MANAGEMENT BY DIFFERENT CONCENTRATIONS OF FLUID IN PUPS

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The present study was conducted to confirm the existence of CPV infection among pups in Ranchi by AGIDT. CPV recorded in almost all breeds of dogs. However it was observed that incidence of CPV was more in German shepherd in comparison to other breeds. Male suffered more than females. 52.76 % cases of gastroenteritis were due to viral infection (CPV), 29.92 % were due to parasitic infestation and 17.32 % were due to bacterial infection. In the present study the incidence of CPV was maximum in winter and lowest in summer season. During the stage of dehydration serum level of sodium, potassium, chloride and glucose was found to be decreased while the level of Blood urea nitrogen was high. During the course of treatment it was observed that fluid therapy with 0.22 % sodium chloride and 5 % dextrose along with cefotaxime gave better result in comparison to other concentration of sodium chloride along with dextrose 5 %.

Key words: Pups, AGIDT, CPV, MDA, Parvogastroenteritis, Dehydration.

Introduction

Parvus is a Latin word which means small and probably due to this reason this virus is known as parvovirus. The size of the virus is 20-25nm in diameter. It is a non enveloped and contained a single stranded DNA Genome. CPV is commonly resistant to physical and chemical inactivation and contaminated environment could remain infective for years. In this context it has been hypothesized that it is one of the most resistant virus known to mankind and remain viable in the extracellular state for months and years. The earliest existence CPV was reported from Belgium and France in (1977). Appel *et al.* (1978) reported CPV in the form of enteritis and or myocarditis in USA. In early 80's the CPV infection was reported from different Metropolitan cities of India. In India the disease outbreak were reported in Madras by Balu and Thangaraj (1981) and in Bombay by Sherikar and Paranjape (1985). CPV is officially designated as CPV-2 to distinguish it from the unrelated minute virus of canine.

The disease occurs in the clinical syndrome i.e parvomyocarditis and parvoenteritis. CPV multiply in cells undergoing mitosis. Hence cell population with a high turnover are most severely affected. Vulnerability of tissue may vary at different stages of development before 8 weeks of age. The myocardial turnover is more than intestinal turnover. so, the virus replicates in myocardium (within 8 week) and produce myocarditis . For CPV to produce myocarditis in puppies, infection must establish within the first week of

life while the heart muscle cells are still dividing. As virtually most of the pups now

born from immuned mothers and so receive maternally derived antibody (MDA) protecting during early life.

Parvomyocarditis is now rare but negligence regarding vaccination of mothers may result into almost 100% fatal myocarditis in young pups. After 8 week of age (after weaning) with alteration in diet and establishment of a varied bacterial intestinal flora, intestinal epithelial turnover is increased but cardiac muscle division is decreasing thus Parvovirus infection at this stage will be more likely to result in Parvoenteritis.

CPV gastroenteritis is severe particularly in pups within the age group of six months characterized by severe persistent emesis inappetence, refusal of food, apathetic nature, bloody diahorrea with foul smell, progressive dehydration, total anorexia and death within a few days. There is slight to high rise of temperature in the initial stage of disease but gradually turn to subnormal level with the advancement of vomiting and diahorrea.

Parvovirus infection poses some riddles for the scientific world as the pathogenicity of the disease is amazingly quick and infections spread rapidly through susceptible canine population. It has been found that at the peak of infection a pup per day may shed 10³ active virus particles per gram of faeces which could have been the main reason of its fastidious spread to other canine population.

Materials and Methods

During the course of present investigation 127 diarrhoeic cases were screened out in pups and adult dogs in and around Ranchi for viral, bacterial and parasitic infestations. Faecal samples were collected in normal saline from all the suspected cases of parvo gastroenteritis under sterile precautions for Agar gel immunodiffusion test (AGIDT) using canine parvovirus (CPV) antigen and CPV positive sera and also for cultural examination, brought to Ranchi veterinary college Hospital, other private pet clinics and government veterinary hospitals of Ranchi. Faecal samples were also collected from all the cases for parasitic infestation. In the present work double diffusion in two dimensions of ocherlony procedure with some modification have been used for confirmatory diagnosis of CPV infection. Faecal materials were properly mixed in saline solution and centrifuged at 6000 rpm in a cooling centrifuge machine (REMI). The supernatant fluid was collected and tested for the presence of parvoviral antigen by AGIDT using CPV antigen and CPV positive sera. All the samples collected were cultured against infection in nutrient agar using Petri dishes and slant smear were prepared on grease free slide and gram staining was done to identify the type of bacteria i.e. gram positive and gram negative. Drug sensitivity test was also done by diffusion method.

For experimental study a total of 12 non-descript clinically healthy pups of both sexes of 3-4 months of age were procured locally. These 12 pups were divided into 4 groups VIZ group -1, group - 2, group- 3 & group -4 consisting of 3 pups in each group and were maintained under same environmental condition and same feeding schedule. Pups of group- 1 was maintained as healthy control group (C) where as pup of group 2, 3, & 4 were maintained as experimentally CPV infected group (E). All these pups were not having the history of gastroenteritis in recent past and their faecal samples were negative for parasitic ova. Faecal samples were taken from all these pups in normal saline for detecting parvovirus infection. The samples which gave positive reactions on AGIDT from clinically infected pups were used for experimental infection to the pups of group-2, group-3 & group-4. Infection was given orally to all these pups and clinical signs like persistent emesis, bloody diarrhoea with foul smell and progressive

dehydration were observed and at the peak of the appearance of clinical symptom treatment was adopted with different concentration of fluid and recent drugs i.e. cefotaxim @ 10 mg/kg body wt. Stage of dehydration was overcome by intravenous infusion of different concentration of sodium chloride with 5 % dextrose VIZ dextrose 5 % and sodium chloride 0.45%, dextrose 5 % and sodium chloride 0.33 %, dextrose 5 % and sodium chloride 0.22 % in different groups, given at 12 hours interval till recovery. Supportive therapy was given like antibiotic(cefotaxime) Antiemetic (Raglan), chromostat, B-complex (Conciple) and antidiarrhoeal drugs (Nildic acids and Metronidazole) was given. Under laboratory examination of blood like TLC, DLC, Hb and PCV and for some serum biochemical profile like glucose, protein, sodium, potassium chloride and blood urea nitrogen was done. Blood collection from experimental pup was done on 0 day , 3rd day, 6th day , 9th day , 12th day and 15th day after giving infection under fasting condition. All the haematological and the biochemical estimation were done as per prescribed standard method.

The statistical analysis and interpretation of data was done by standard method and formula as described by Senedecor and Cochran (1994).

Results and Discussion

The incidence of gastroenteritis during the present study in pups of less than 6 months of age was 70.8% while in above 6 months age it was 29.2%. sex also showed influence on incidence of Parvo gastroenteritis. Males suffered more (54.33%) than female (45.66 %). The incidence of Parvo gastroenteritis was highest in German shepherd (40.94 %) followed by other breeds likes German spitz (23.62 %), Doberman Pinscher (12.59 %), Labrador (3.14 %), Dachshund (6.29 %) , Great – Dane (1.57 %) ST. Bernard (3.14%), Rottweiler (3.14 %), and Dalmatian (3.93%).

Out of 127 pups screened during the present investigation 52.76% cases of gastroenteritis were due to parvoviral infection. 29.92% were due to parasitic infection and 17.32% were due to bacterial infection i.e. from gram positive and gram negative.

Experimentally CPV infected pups showed typical signs of viral haemorrhagic gastroenteritis on 4th day onward experimental inoculation like anorexia, vomiting and brownish to bloody foetid haemorrhagic

diahorrea. During the present investigation the sodium level (milimol/ lit) was decreased during the stages of dehydration. Due to dehydration and emesis it was as low as 131.5 ± 0.94 in group 2 on 6th day of observation. Which increases upto 173.5 ± 1.72 milimol/L on 9th day of observation. In group-4 the sodium level was 132.4 ± 1.12 which increases upto 158.2 ± 0.98 on 9th day of treatment. The treatment with 0.22% sodium chloride and dextrose 5% in group 4 gave better result than other concentration of sodium chloride. Heald and Jhones (1986) also observed hypernatraemia in CPV enteritis. The serum potassium level was as low as 2.71 ± 0.15 on the peak of parvo viral infection which improved upto 4.50 ± 0.27 after treatment. Which is also supported by chakravorty (1994) who mentioned that level of potassium depleted from the body in addition to severe water loss during dehydration.

The mean value of chloride (m Eq/L) was as low as 83.60 ± 0.43 which improved upto 119.10 ± 0.31 on 9th day of treatment which is also supported by Heald and Jhones (1986) who reported that hypochloraemia is evident in gastroenteritis.

The glucose level in group- 2 was as low as 62.20 ± 0.79 mg % during the peak period of parvoviral infection which increases upto 250.00 ± 4.37 on 9th day of treatment. The depletion of glucose during the present study has been supported by Chakravorty (1994). The BUN was increased upto 48.75 ± 0.76 mg/dl which reduces after treatment upto 12.12 ± 0.91 mg/dl.

The haemoglobin level in gastrohaemorrhagic cases was as low as 10.30 ± 0.17 gm%. Which slightly increased after the treatment showing the value of 10.50 ± 0.11 gm%. During dehydration in severe parvogastroenteritis the PCV was as high as 37.00 ± 0.34 % which return to its normal value

of 30.80 ± 0.56 after treatment. The total leukocytic count revealed leukopaenia in the early stage of infection while DLC were found unaltered by infection and fall within normal range.

On the basis of present investigation it has been concluded that the effect of 0.22% sodium chloride with 5% dextrose as fluid therapy was found better than other concentration of fluid as it maintained the normal sodium level in the blood. Cefotaxime was found very effective to control secondary bacterial infection. In present study AGIDT is one of the confirmatory test for CPV antigen. It is simple and can be performed in laboratories with basic facilities. This test can be recommended as test of choice in routine diagnostic investigation of CPV infection.

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