Archives of Current Research International

Volume 24, Issue 4, Page 171-174, 2024; Article no.ACRI.115288
ISSN: 2454-7077

Immunoglobulin Based Therapeutic Approach for Parvo Virus Infection in Dog: A Case Report

Naba Jyoti Deka [a*], Dhruba Jyoti Kalita [a], Prasanta Chabukdhara [b], Derhasar Brahma [c], Chinmoy Dutta [d] and Biraj Bania [e]

[a] Department of Veterinary Biochemistry, College of Veterinary Science, Assam Agricultural University, Guwahati-781022, Assam, India.
[b] Department of Veterinary Physiology & Biochemistry, Lakhimpur College of Veterinary Science, Assam Agricultural University, North Lakhimpur, Assam, India.
[c] Department of Microbiology, College of Veterinary Science, Assam Agricultural University, Guwahati-781022, Assam, India.
[d] Department of Livestock Production & Management, College of Veterinary Science, Assam Agricultural University, Guwahati-781022, Assam, India.
[e] Department of Animal Reproduction Gynaecology & Obstetrics, College of Veterinary Science, Assam Agricultural University, Guwahati-781022, Assam, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/ACRI/2024/v24i4673

Open Peer Review History:
This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: https://www.sdiarticle5.com/review-history/115288

Case Report

Received: 25/01/2024
Accepted: 29/03/2024
Published: 03/04/2024

ABSTRACT

Canine parvo viral infection is a highly contagious disease in dog with high mortality rate in untreated cases. This study represents a case report of an unvaccinated 4 months old German shepherd puppy presented with a history of profuse foetid diarrhoea, vomition, inappetence and

**Corresponding author: Email: nabajyotiacademic@gmail.com;*

depression for 2 days. Physical examination of the dog revealed sub normal temperature (99.5°F), abdominal pain, bloat, severe dehydration and debility. Haematology showed low RBC count, low Hb level, low Hct value, lower MCV and mild lymphopenia. The dog was diagnosed as canine parvoviral infection based on the result of rapid antigen test and the characteristic clinical findings. The treatment included fluid replacement therapy, antimicrobial drug, antiemetic, haemostatic agent along with immunoglobulins. An instant onset of passive immunity is developed upon IV administration of immunoglobulins. The pup showed good response from 3rd day of the treatment and finally recovered successfully. Thus, administration of specific immunoglobins along with standard treatment regimen in canine parvo virus infection can be effective in reducing mortality in dogs.

Keywords: Canine parvovirus infection; rapid antigen test; immunoglobulin.

1. INTRODUCTION

Canine parvovirus (CPV) infection caused by Canine parvo virus 2 (CPV2) is a highly contagious and a serious life-threatening viral disease in dog with high morbidity (100%) and varying mortality up to 10-18% in adults and 91% in pups if left untreated [1,2,3,4]. CPV mainly occurs in two prominent clinical forms: (i) haemorrhagic gastroenteritis with vomition, foul smelling bloody diarrhoea and severe leukopenia affecting all age group of dogs [5,6,7], (ii) myocarditis and subsequent heart failure in pups up to 3 months of age [8]. CPV 2 is extensively shed in faeces for 7–12 days or possibly for long-term duration, which help it to spread rapidly among the population [9]. Prevalence of CPV infection in Assam was 25.28 to 62.86% [10,11,12] with 41.86% in 4-6 months age group (Deka et al., 2013), 51.85% in 7-12 months of age group, 50.l8% in male and was highest in German spitz breed with 55.21% [11]. CPV infection was recorded higher in unvaccinated dogs with 30.15% compared to 9.52% in vaccinated dogs [4]. Season-wise, occurrence of CPV was recorded highest in pre-monsoon (43.18%) followed by winter (34.62%) [4].

2. PRESENTATION OF CASE

One four months old, weaned German shepherd puppy was brought with a history of profuse foetid smell diarrhoea, vomition, dull, depressed and inappetence for 2 days. During physical examination, the puppy had sub normal temperature (99.5°F), severe dehydration, sunken eyes, severe debilitation, abdominal pain and bloat. The puppy along with its mother was unvaccinated and not dewormed regularly. Blood sample was collected and sent for haematology. The faeces were collected and subjected for rapid immunochromatographic based antigen (Ag) test (Quickvet, Ubio) for detection of canine parvo virus Ag. The affected puppy had low RBC count ($4.2\times 10^6/mm^3$), low Hb level (8.3 g/dl), low Hct value (21.2 %), lower MCV (21.2 %) and mild lymphopenia (9.3%). Based on the result of rapid antigen test and clinical findings, the diagnosis was made as canine parvo virus infection and accordingly treatment had been commenced.

Fig.1. Parvo infected pup during treatment

Fig. 2. After treatment

3. DISCUSSION

The treatment was started with intra venous (IV) fluid replacement therapy that included 5% DNS and Ringer's lactate infusion to restore the fluid & electrolyte loss. Pantoprazole was administered IV @1 mg per kg body weight (b. w.) OD for 10 days along with Ondansetron @ 0.1 mg per kg b. w. IV BID for 7 days. Gentamicin was given @ 10 mg per kg b. w. slow IV OD for 7 days to lower the possibility of bacterial translocation across the disrupted intestinal epithelium in the gastrointestinal tract. Metronidazole was injected @ 10 mg per kg b. w. slow IV for 7 days to lower the intestinal parasites which may exacerbate the infection by increasing intestinal cell turnover and subsequent viral replication [13]. Tranexamic acid was also given slow IV @ 10 mg per kg b. w. of the animal. Based on the severity of the infection, purified hyperimmune immunoglobulin (Immunoglobulinum anti parvovirosis canis NLT 1024 HIU, Canglob ® -P) was administered IV @ 0.4 ml per 1 kg of body weight of the animal for 5 days. The pup showed good response from 3rd day of treatment. Injecting specific immunoglobulins at the clinical phase of canine parvo virus infection can improve the clinical symptoms, reduce mortality and subsequently facilitate rapid recovery of the patient [14,15,16]. Intravenous administration of Immunoglobulin, IgY derived from chicken egg yolk had been reported to inhibit the propagation of CPV infection and thus reduce the fatality [15]. In another study, freeze-dried immunoglobulin G was found to diminish clinical symptoms and shorten hospitalization duration in naturally acquired CPV enteritis [17]. The establishment of passive immunity in the host body depends on the route of administration, quantity of immunoglobulin and frequency of replications of immunoglobulin administration. Immediate induction of passive immunity is observed following intravenous (IV) administration as compared to intramuscular or subcutaneous administration [18].

4. CONCLUSION

Based on the present case study, it may be concluded that early administration of specific immunoglobins in canine parvo virus infection can be effective in ameliorating the clinical symptoms and reducing mortality.

ETHICAL APPROVAL

Animal Ethic committee approval has been collected and preserved by the author(s)

ACKNOWLEDGEMENT

The authors declare no sponsorship to carry out the study**.**

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle5.com/review-history/115288