

A Case Study on Management of Canine Distemper in an Indigenous Dog



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Table of Contents

Abstract	2
Introduction	3
Case Presentation	5
2.1 Clinical history and observation	5
2.2 Case management	7
Results and Discussion	8
3.1 Result	8
3.2 Discussion	8
Conclusion	10
References	11
Acknowledgement	12
Biography	13

List of Figures

Serial	Figure caption	Page
Figure 1	CDV Ag rapid kit test	5
Figure 2	Drug administration	6
Figure 3	Amoxicillin	7
Figure 4	Amino acid preparation	7
Figure 5	Pheniramine maleate	7
Figure 6	Dextrose	7
Figure 7	Phenobarbitone	7

List of Table

Serial	Table name	Page
Table 1	Blood examination report (Biochemical)	6
Table 2	CBC report	6

List of abbreviations

Abbreviations	Elaboration
CDV	Canine Distemper Virus
SAQTVH	Shahedul Alam Quaderi Teaching Veterinary Hospital
CVASU	Chattogram Veterinary and Animal Sciences University
CBC	Complete Blood Count
Ag	Antigen
SGOT	Serum Glutamic-Oxaloacetic Transaminase
SGPT	Serum Glutamic Pyruvic Transaminase
RT-PCR	Reverse Transcription Polymerase Chain Reaction
ELISA	Enzyme-Linked Immunosorbent Assay
CSF	Cerebro-spinal Fluid

Abstract

Canine distemper is a highly contagious and frequently lethal disease that affects multiple systems in dogs. The disease primarily affects unvaccinated young male dogs, particularly those of local breeds that are 0–6 months old. It is most common during the winter months. Clinical indications begin with gastrointestinal and respiratory issues, then advance to severe neural symptoms, which, in many cases, result in death. RT-PCR and the Canine Distemper Ag fast kit test are a couple of laboratory tests that help with early and precise detection. The management of CDV infection is challenging. Treatment involves supportive care and antibiotics to prevent secondary bacterial infections. This study focuses on a 3-month-old male local dog diagnosed with CDV infection. The clinical signs involved seizures, anorexia, and vomiting, leading to a fatal outcome despite treatment. Early diagnosis, proper care, and vaccination are essential in preventing the spread of canine distemper.

Keywords: Dog, Canine Distemper, Management, Indigenous

Chapter 1

Introduction

Canine distemper (CD) is an extremely contagious disease that transmits through the air and affects an animal's respiratory, digestive, neurological, cardiovascular, and immunological systems and it has a higher case fatality next to rabies (Beineke et al., 2015). All groups of the order Carnivora are included in the natural host range of the canine distemper virus (CDV) (Deem et al., 2000). Puppies are the ones who get the sickness most frequently the mother-derived antibodies start to disappear before puppies become immune competent (Kim et al., 2006). The virus that causes canine distemper belongs to the family Paramyxoviridae and genus Morbillivirus (Deem et al., 2000).

The canine distemper virus primarily targets lymphoid organs and mucous membranes for infection. After entering the body through aerosols, the virus multiplies mainly in the respiratory tract's lymphatic tissues before spreading to other organs such as the central nervous system, lower respiratory and gastrointestinal tract cells, lymphoid organs, and the bladder. (Appel, 1987).

The incubation period might extend up to 4 weeks. Initial signs include transient fever, loss of appetite, slight depression, ocular with nasal discharge and tonsillitis, coughing, dyspnea, pneumonia, vomiting, diarrhea, keratoconjunctivitis. The degree of virulence, the animal's age, and its immune condition all affect how severe the symptoms are. If the dog's immune system strengthens at this point, the illness will be fully cured. The virus can enter the central nervous system and epithelial tissue of the dog with a low immunity. 20 days after infection neurological signs such as circling, nystagmus, paresis or paralysis, convulsion, dementia, seizure, involuntary urination and defecation, involuntary twitching of muscle preceded by chewing-gum movement of the mouth develop which considered as the typical sign of CD virus infection. As a result of epithelial localization, hyperkeratosis of the foot pads and nose, enamel hypoplasia are observed which are also typical sign of CDV infection (Martella et al., 2008).

There are various tests for diagnosis of CDV infection. Presumptive diagnosis can be made based on clinical sign. Some clinical signs like keratoconjunctivitis, purulent ocular and nasal

discharge, diarrhea, respiratory catarrh, fever strongly reflect the presence of CDV infection. Several laboratory tests are available for confirmatory diagnosis of CDV infection. Whole blood, nasal and ocular discharge, urine, CSF, feces can be used as specimen for laboratory tests. Nasal or ocular discharge, feces and blood serum are most specific for virous detection among all specimen. CDV Ag rapid kit test, ferret inoculation test, enzyme linked immune sorbent assay (ELISA), immunohistochemistry, reverse transcriptase polymerase chain reaction (RT-PCR) can be used for confirmatory diagnosis. Among these, CDV Ag rapid kit test and RT-PCR are useful, fast, sensitive and specific method for diagnosis (Shabbir et al., 2010).

The distemper virus in dogs is fatal. The basic principles of treatment usually include supportive care and antibiotics to prevent secondary bacterial infection that is common in immunosuppressed animals (Elia et al., 2008).

In this case report, diagnosis and management of a CDV positive dog is described.

Chapter 2

Case Presentation

2.1 Clinical history and observation

A 3 months-old male local dog weighing 3.6 kg was bought to the chamber of a renowned private veterinarian of Chattogram with a history of dying of one of his siblings just a week before. The animal was suffering from anorexia, seizure, circling movement, and vomiting for last few days. Physical examination revealed that, initial temperature was 104⁰F, mild dehydration, increase respiratory and heart rate though the mucous membrane was normal. As the signs were suggestive for CDV infection, CDV Ag rapid kit (Intron biotechnology, South Korea) (Figure1), blood CBC, serum biochemical tests (SGPT, SGOT and Creatinine), were done for confirmatory diagnosis. On CBC there found low level of hemoglobin (10.3 gm%), and PCV (34%), increased level of lymphocytes (50%) (Table 2). The biochemical tests revealed the SGPT, SGOT and Creatinine level within normal range (Table 1). The case was diagnosed as CDV infection on the basis of clinical history, clinical signs, positive result of Rapid Test kit and result of hematological and biochemical tests.



Figure 1 : CDV Ag Rapid Kit Test (Positive)

Table 1: Blood Examination Report (Biochemical)

Name of the Tests	Result	Normal Range
SGOT	51.4	23-66 g/dl
SGPT	26.1	21-102 mg/dl
Serum Creatinine	1.1	0.5-1.5 g/dl

Table 2: CBC report

Name of the Tests	Results	Normal Range
Hemoglobin	10.3	12-18 gm%
ESR	0	0-6 (mm in 1 hour)
Total Count of TEC/RBC	4.4	5.5-8.5 (million/Cumm)
Total Count of TLC/WBC	4.9	6-17 (Thousand/Cumm)
Platelet	-	
PCV	34	37-55%
Differential Count of WBC		
Lymphocytes	50	12-30 %
Neutrophils	45	60-77%
Eosinophils	3	2-10%
Monocytes	2	3-10%
Basophils	-	0-1%

2.2 Case management

The dog was prescribed an antibiotic injection Amoxicillin @ 25mg/ kg body weight intramuscularly for 5 days to combat secondary bacterial infection, antihistamine Pheniramine maleate @ 3mg/ kg body weight intramuscularly for 3 days to minimize side effects of antibiotic, meloxicum @ 0.1mg/ kg body weight subcutaneously to reduce fever and pain, nutritional supplement amino acid preparation @ 0.25 ml/kg body weight subcutaneously for 5 days and glucose preparation 8ml/kg body weight subcutaneously for 5 days for correction of weakness and fluid deficiency, Phenobarbitone Sodium injection @5mg/kg body weight was given intramuscularly for 3 days to stop seizures.



Figure 2 : Drug administration



Figure 3: Amoxicillin



Figure 4: Amino acid preparation

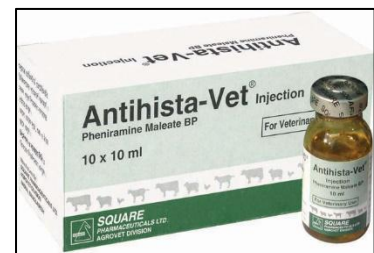


Figure 5: Pheniramine maleate



Figure 6: Dextrose



Figure 7: Phenobarbitone

Chapter 3

Results and Discussion

3.1 Result

Fluid therapy and other supportive treatment was continued for 4 days of diagnosis of CD. Unfortunately, the condition was deteriorating as the dog was very young and somehow immune compromised because his mother left him in his very early age and he could not consume addlibitum milk of mother. Moreover, the dog was brought to medication at the very last stage of disease. As a result, the dog was died at 4th day of medication.

3.2 Discussion

One of the most common diseases in dogs is canine distemper, which is marked by high rates of morbidity and mortality, especially in dogs that are 3 to 6 months old (Elia et al., 2006). Another study of (Buragohain et al. 2018) said, (0-6) months aged pup is most susceptible to this fatal disease. The dog in this study was 3 months old which concurs with previous findings (Elia et al., 2006; Buragohain et al. 2018) where they showed that, highest prevalence of CDV infection found in local dogs (43.1% out of 58 cases). The dog in this study was a local breed that concurs with (Buragohain et al. 2018) findings. According to the findings oth previous study, female dog is more susceptible than male but fatality rate is high in male and said, highest occurrence of CDV infection is in male (58.62% out of 58 positive case) ((Buragohain et al. 2018; Mousafarkhani et al. 2023). In this study, the affected dog was male which agrees findings of (Buragohain et al. 2018) but disagree with (Mousafarkhani et al. 2023), and the disease resulted in a fatal outcome for the dog. Also, (Mousafarkhani et al. 2023) said, out of 1212 CDV positive dog, 91.84% was unvaccinated and highest prevalence (71.43%) of this disease was during cold season. The dog in this case was unvaccinated and the dog was attended at hospital at starting of winter season (October month) in Bangladesh which agree the findings of (Mousafarkhani et al. 2023).

According to (Martella et al., 2008), affected animal shows various type of signs as it is a multisystem affecting disease. Signs includes, transient fever, loss of appetite, slight depression, ocular with nasal discharge and tonsilitis, coughing, dyspnea, pneumonia, vomiting, diarrhea, keratoconjunctivitis initially. As disease progress, circling, nystagmus, paresis or paralysis, convulsion, dementia, seizure, involuntary urination and defecation,

involuntary twitching of muscle preceded by chewing-gum movement of the mouth, hyperkeratosis etc are seen. In this study, the affected dog shows mainly nervous signs including circling, seizure, anorexia, inco-ordinance, aggressiveness, biting tendency.

According to (Shabbir et al., 2010), various diagnostic tests can be used for confirmatory diagnosis of CDV infection such as, CDV Ag rapid kit test, ferret inoculation test, enzyme linked immune sorbent assay (ELISA), immunohistochemistry, reverse transcriptase polymerase chain reaction (RT-PCR). In this case, presumptive diagnosis was based on clinical signs and for confirmation CDV Ag rapid kit test, biochemical test and CBC was done.

As CDV infection is an incurable disease, management of this disease is difficult. (Elia et al., 2008) said, antibiotics for secondary bacterial infection prevention and additional supportive care is the basic principle of CDV infection management. The case described in this study, was managed by the same way as told by (Elia et al., 2008).

Chapter 4

Conclusion

Canine distemper is mostly a death-defying disease of dogs. Unvaccinated local male dogs, generally 0–6 months of age, are most susceptible to this disease. The highest prevalence of this disease is seen in the winter season. Several laboratory tests are developed to diagnose the disease. But the CDV Ag rapid kit test and RT-PCR are the most useful and easy tests for rapid diagnosis. Management of this disease is difficult, but diagnosis at an early stage of the disease, antibiotics, and proper supportive treatment with care may help the patient recover.

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The author

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Biography

My name is Kazi Towhidul Islam, and I am the son of Kazi Mozaffar Ahmed and Khadiza Akter. I successfully completed my Secondary School Certificate (SSC) education at Bayezid Line High School in 2014 with a perfect GPA of 5.00. Furthermore, I accomplished my Higher Secondary Certificate (HSC) from Govt. Mohsin College, Chattogram in 2016, also achieving a GPA of 5.00.

At present, I am serving as an intern veterinarian within the Faculty of Veterinary Medicine at Chattogram Veterinary and Animal Sciences University. Looking ahead, my aspirations revolve around becoming a veterinary pet practitioner, utilizing my skills and knowledge to contribute positively to animal health and well-being.

My academic interests are particularly focused on Public Health and Molecular biology. I am enthusiastic about the opportunity to engage in research endeavors in these areas in the near future.