



Case Report

MANAGEMENT OF HAEMORRHAGIC GASTROENTERITIS AND ITS ASSOCIATED COMPLICATIONS IN A POMERANIAN DOG

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Abstract- Two and a half years old male Pomeranian dog was reported with a history of fever, haemorrhagic gastroenteritis, frequent vomiting, foul smelling diarrhoea, hematochezia, profuse salivation, halitosis, inappetence and lethargy. Diagnostic protocol included haematological examination, serum biochemical examination, routine urine examination, trans-abdominal ultrasonography (USG), plain and contrast radiography of abdomen. Hematological examination indicated viral haemorrhagic gastroenteritis with severe leucopenia. During the course of disease, urinary tract infection (UTI) was observed as a secondary bacterial complication, diagnosed through routine urine tests and urine bacteriological culture examination. Culture examination of urine revealed *Pseudomonas aeruginosa* infection. Serum biochemical examination revealed deviation from the normal values in the initial phase which were later on found to be normal at the time of recovery. USG and radiography reports were normal. The treatment involved administration of appropriate fluid therapy, sensitive parenteral antibiotic and supportive therapy. The condition of the dog improved gradually and complete recovery occurred three weeks after the treatment.

Keywords- Haemorrhagic gastroenteritis, Canine parvovirus, *Pseudomonas aeruginosa*, Immunosuppression

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Introduction

Haemorrhagic gastroenteritis (HGE) can be defined as a pathological condition which is clinically characterized by sudden onset of vomiting, diarrhea with hematochezia and is most often associated with depression and anorexia [1]. It has been reported to be the most common condition observed in dogs [2]. Numerous etiologies have been suspected for the occurrence of HGE in dogs which includes food allergies and various infectious agents [3]. Amongst infectious agents causing HGE in dogs, canine parvovirus (CPV) has been reported as the main causative agent [4]. During the course of CPV infection, severe leucocytopenia develops due to bone marrow infection [5]. Most of the time dog affected with HGE succumb to death due to blood loss and dehydration however the present case describes successful therapeutic management of HGE and its associated complications which is significant in relation to diagnostics and therapeutics of viral infection.

Case history and Observations

Two and half year-old pure breed male Pomeranian dog was reported to Veterinary Clinical Complex, COVS, Hisar with a history of fever, foul smelling bloody diarrhoea, frequent vomiting, hematochezia, profuse salivation, halitosis, inappetence and lethargy for three days. There was no history of vaccination. The owner also reported that his other adult Rottweiler pet dog at home also suffered with HGE. Stomatitis and glossitis were so severe that the dog was resisting physical examination of the oral cavity. The dog was immediately provided with symptomatic and supportive therapy and the blood sample was sent for hematology. Transabdominal sector-array ultrasonography (equipped with 3.5 MHz transducer) was performed to monitor the status of stomach, liver, spleen, pancreas, intestine, kidney and urinary bladder. Plain and contrast radiography of abdomen was also performed.

Diagnosis, Treatment and Discussion

Day wise alterations in hematology are summarized in [Table-1] and depicted in Figure 1, 2 and 3. Day wise reports of serum biochemical parameters and routine urine examination are also presented in [Table-2] and [Table-3]. Reports of plain and contrast radiography are depicted in Figure 4 and 5. On day one of treatment, the dog was given intravenous NSS @100ml, inj. Cefotaxime @125mg, i/v, inj. Vetalgine @0.5mg/kg. b.wt., i/v, inj. vitamin C @ 200mg supplement, i/v, Inj. Metronidazole @10mg/kg b.wt. i/v, inj. pantaprazole @ 5mg, i/v, inj. Eldervit one dose, i/v, inj. Stemetil 0.2mg/Kg. b.wt., i/m and inj. atropine sulphate @0.025mg/Kg. b.wt., subcutaneously. Mecovet @0.5mg/kg. b.wt. was also advised on alternate days through i/m route. On second day excessive salivation, HGE and nausea persisted but vomitions stopped. The treatment was followed for five days and the frequency of vomiting and haemorrhagic enteritis was markedly reduced but did not subside. The reports of plain and contrast radiographs were normal. Nothing abnormal was detected in abdominal USG examination. The dog developed hematuria on fifth day of the treatment. Hematological examination, serum biochemical examination and routine urine tests were recommended [Table-1,2,3]. Considering complication, urine routine test [Table-3] and urine culture sensitivity test (CST) were advised after withholding the antibiotic for three days and continuing the supportive treatment. A 4.3mm urolith was observed in urinary bladder during USG examination. CST of urine revealed *Pseudomonas aeruginosa* infection sensitive to Gentamycin, Amikacin, Kanamycin, Norfloxacin, Ceftriaxone, Amoxicillin-clavulanate, Enrofloxacin and Chloramphenicol. On day eight, the treatment involved appropriate fluid therapy, sensitive parenteral antibiotic i.e., Intacef Tazo (Ceftriaxone Tazobactam) @ 25mg/kg. b.wt., i/v, antiemetics, antacids and parenteral vitamin B and C supplements. The owner was advised not to provide anything orally to the dog.

Table-1 Day wise haematological alterations in the dog having HGE

Day	Hb (g %)	TLC x 10 ³ /mm ³	DLC%					Significance of hematological alterations
			N	L	M	E	B	
Day 1	7.4	1150	Not countable on blood smear					Anaemia, Leucopenia Suspected for viral infection
Day 5	7.4	1,43,500	94	04		02	-	Anaemia, severe leucocytosis with regenerative shift to left, bacterial infection
Day 8	7.0	1,65,000	90	09		01	-	Anaemia, severe leucocytosis with regenerative shift to left, bacterial infection
Day 14	8.0	19,000	72	22		06	-	Increase in Hb concentration, TLC and DLC in normal range
Day 21	10	8200	45	42	01	12	-	Increase in Hb concentration, Leucocyte parameters within normal range

Table-2 Day wise alterations in urine of dog

Chemical Examination				Microscopic examination (per high power field)						Significance
Day	Albumin	Sugar	Ketone	Pus cells	R.B.C	Crystals	Epithelial Cells	Casts	Bacteria	
Day 5	Present (++)	Absent	Absent	80-100	2-3	Calcium oxalate 5-6	4-5	Granular 5-6	Present	Bacterial Urinary Tract Infection (UTI)
Day 8	Present (+)	Absent	Absent	80-90	Rare	Calcium Oxalate	4-5	Granular 1-2	Present	Bacterial UTI
Day 21	Absent	Absent	Absent	Nil	Nil	Nil	Nil	Nil	Absent	Nil

Table-3 Day wise alterations in serum biochemical parameters with their significance in differentiating disease diagnosis

Parameter	Day	Result	Normal range	Significance
Liver Function Tests				
SGPT	Day 5	97.4 IU/L	10-109 IU/L	Within the normal range
	Day 21	28.7 IU/L		
SGOT	Day 5	115.1 IU/L	5-55 IU/L	Increase, suspecting liver and kidney affection
	Day 21	34.7 IU/L		Within normal range
Alkaline Phosphatase	Day 5	1635 IU/L	1-114 IU/L	Increase, suspecting liver, kidney and GIT infection
	Day 21	62 IU/L		Within the normal range
Total Bilirubin	Day 5	0.30 mg/dl	0-0.3mg/dl	Within the normal range
	Day 21	0.06 mg/dl		
Albumin	Day 5	2.34 g/dl	2.3-3.1 g/dl	Within the normal range
	Day 21	3.07 g/dl		
Kidney Function tests				
Urea	Day 5	40 mg/dl	8-28 mg/dl	Increase, suspecting uraemia
	Day 21	18.8 mg/dl		Within the normal range
Creatinine	Day 5	4.10 mg/dl	0.1-2 mg/dl	Increase, suspecting uraemia
	Day 21	0.48 mg/dl		Within the normal range
Pancreatic function tests				
Cholesterol	Day 5	178 mg/dl	135-278 mg/dl	Within the normal range
	Day 21	150 mg/dl		
Serum Lipase	Day 5	324.4 U/L	0-50 U/L	Increase, suspecting GIT disorder
	Day 21	39.8 U/L		Within the normal range
Serum amylase	Day 5	1389U/L	226-1063 U/L	Increase, suspecting GIT disorder
	Day 21	411 U/L		Within the normal range
Glucose	Day 5	31.6 mg/dl	76-119mg/dl	Decrease, suspecting GIT disorder, off-fed animal
	Day 21	125.1 ma/dl		Normal to marginal increase

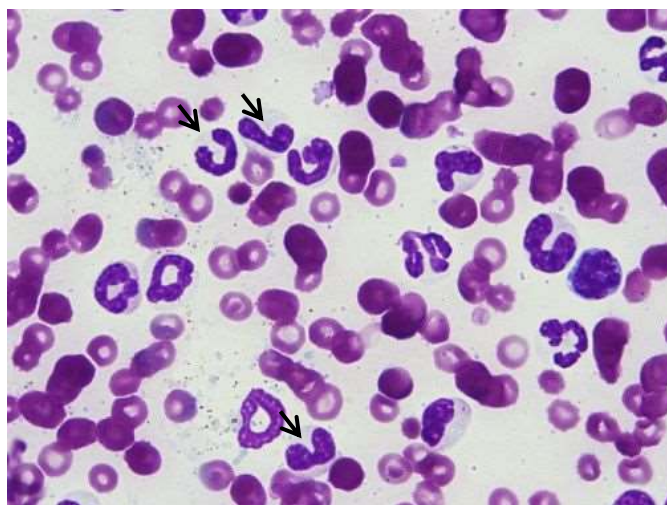


Fig-1 Severe neutrophilia with presence of band cells (arrow)

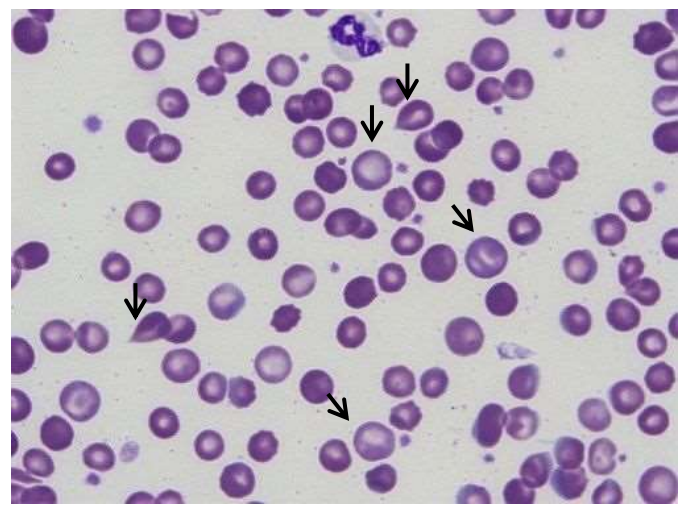


Fig-2 Regenerative type of anaemia indicated by presence of reticulocytes (arrow), anisocytosis and poikilocytosis (tear drop cells-indicated by arrow head)

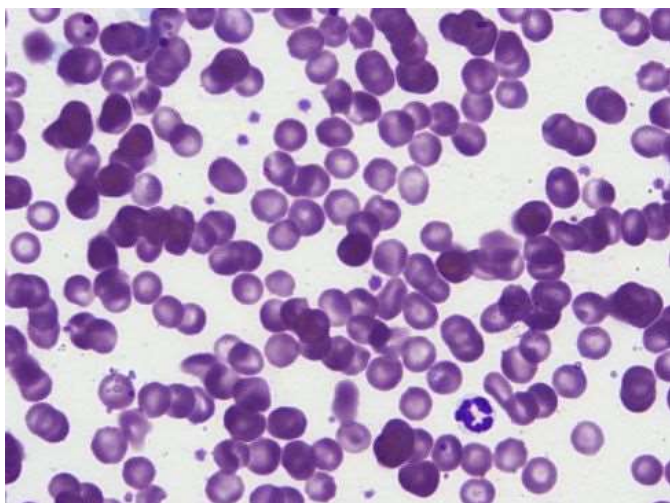


Fig-3 Blood smear showing normal RBCs and neutrophil of recovered animal
Note: no evidence of leukocytosis and regenerative anaemia



Fig-4 Plain radiograph of abdomen (Lateral view) (Normal)



Fig-5 Barium meal contrast radiograph of abdomen (Lateral view) revealed no obstruction in GIT

The condition of the dog improved gradually and complete recovery occurred after three weeks of treatment (Day 21). No relapse was reported even after a month of the treatment and the dog was appropriately vaccinated afterwards. The case reported to VCC, COVS, Hisar, presents HGE which was probably be due to CPV infection indicated by clinical findings and results of hematological examination. Development of severe leucocytopenia in this case leads to contraction of secondary bacterial infection. Hematuria during the course of disease suspects

UTI which was confirmed by routine urine tests and urine culture for bacterial infection. The presence of *Pseudomonas aeruginosa* infection in urine indicated secondary bacterial complication. Nivy *et al.* [6] also observed that dogs with CPV infection undergo severe neutropenia and immunosuppression which subsequently increases the susceptibility for development of secondary bacterial infections. Suchodolski *et al.* [7] reported higher abundance of bacteria of genera *Pseudomonas* and others in dogs with inflammatory bowel disease. *Pseudomonas aeruginosa* infection has been mostly observed as secondary infection specifically as an opportunist during conditions of immunosuppression. These bacteria are a primary cause of UTI in dogs [8]. Koutinas *et al.* [9] reported that pups with CPV infection are 5 times more susceptible for development of asymptomatic UTI which is probably due to contamination of external genitalia from infected fecal contents during state of neutropenia.

Application of research: Case study describes successful therapeutic management of HGE and its associated complications in a Pomeranian dog which is significant in relation to diagnostics and therapeutics of viral infection

Research Category: Veterinary Sciences

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Conflict of Interest: None declared

Ethical approval: Clinical case study at Veterinary Clinical Complex, College of Veterinary Sciences, Hisar.
Ethical Committee Approval Number: No experimental studies were performed during the clinical case

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