ISSN: 1220-3173; E-ISSN: 2457-7618

DESCRIPTION OF SEVERE HAEMORRHAGIC GASTROENTERITIS IN A 5 MONTHS OLD PUPPY. A CASE REPORT

DESCRIEREA GASTROENTERITEI HEMORAGICE LA UN CĂȚEL ÎN VÂRSTĂ DE 5 LUNI. RAPORT DE CAZ

Monica Ioana SUĂTEAN[1),*)], Marina SPÎNU[1)], Diana Ioana OLAH[1)], I. VASIU[1)], A.V. POTÂRNICHE[1)], R.A. POP[1)], A. VASIU[1)], G.F. BRUDAȘCĂ[1)]

ABSTRACT | REZUMAT

Despite having been discovered 40 years ago, parvovirosis still imposes as a disease of utmost importance in the canine population. Young unvaccinated puppies are extremely prone to the infection with parvovirus (CPV), disease to which a high mortality is attributed. This paper reports a 17 days long treatment in the case of a 5-months-old mixed breed dog (*Canis lupus familiars L.*), which based on the clinical signs was suspected of parvoviral gastroenteritis. In no other CPV case treated in our clinic was the design of the therapeutic protocol so complex or the treatment extended for such a long period of time. Alongside clinical evaluation, rapid antigen testing, biochemical, haematological and abdominal ultrasound examinations were performed. The treatment protocol was carried out at the Infectious Diseases Department, Faculty of Veterinary Medicine of Cluj-Napoca.

Keywords: gastroenteritis, hematology, antibiotics

Tineretul canin nevaccinat este extrem de sensibil la infecția cu parvovirus (CPV), boală căreia îi este atribuit un grad mare de mortalitate. În ciuda faptului că această patologie a fost descoperită cu mai bine de 40 de ani în urmă, parvoviroza încă se impune ca boală de maximă importanță la câinii tineri. Prezenta lucrare raportează un caz de parvovirază la un pacient, metis, în vârsta de 5 luni (*Canis lupus familiars L.*) caz al cărui tratament a durat 17 zile. În niciun alt caz de gastroenterită parvovirală tratat în clinica noastră nu a fost implementat un protocol terapeutic atât de complex sau extins pentru o perioadă atât de lungă de timp. În plus față de evaluarea clinică, s-a realizat testarea prin intermediul testelor rapide efectuându-se, de asemenea examene biochimice și hematologice, precum și ecografii abdominale. Protocolul terapeutic a fost instituit în cadrul departamentului de Boli Infecțioase al Facultății de Medicină Veterinară din Cluj-Napoca.

Cuvinte cheie: parvovirus, hematologie, antibiotice

One of the most significant diseases affecting dogs, parvovirosis is highly contagious and associated with high morbidity (100%) (12,14). The mortality rate can range between 25% -35% or even up to 43% (2, 13). The agent was first discovered in the 1970[s], when it caused a worldwide pandemic (6). The strain involved in the outbreak was named CPV-2 in order to be differentiated from the 'minute virus of canines' (MVC) (13, 15). The virus can be acquired via faecal-oral route, but also by contact with contaminated fomites such as clothing, hospital tables, food pans and kennel floors (9). From an epidemiological, as well as from a clinical point of view, it is important to note that the viral shedding may continue for a period up to 4 weeks following the clinical course (10). Clinical signs may include severe vomiting, dehydration, haemorrhagic diarrhoea and anorexia (9). Histologically, the lesions are characterized by intestinal necrosis with erosions and ulcers in the mucosa (3, 4).

Because of their lack in specificity, haematological and biochemical assays are unable to certify a presumptive diagnosis of parvovirosis, but they can provide important information in order to evaluate the patient's response to treatment. Typical changes observed on an ultrasound examination in parvoviral enteritis include fluid-filled, atonic small and large intestines, duodenal and jejunal mucosal layer thinning with or without indistinct wall layering and irregular luminal-mucosal surfaces (9).

Given that the intervention is prompt in the early stages of the infection, infectious gastroenteritis could be managed by therapeutic usage of fluids coupled with continuous monitoring up to 48 h, administration of antimicrobials, as well as supportive remedies (14). However, it is critical that the patient's careful monitoring and therapeutic protocol adjustment continues up to the last day of treatment.

This paper aimed to describe a case of haemo-

1) University of Agricultural Sciences and Veterinary Medicine, Faculty of Veterinary Medicine of Cluj-Napoca, Romania
*) *Corresponding author: monica.suatean@usamvcluj.ro*

Table 1

Haematological assays

INITIAL HEMATOLOGICAL ASSAY			
WBC 10^9/L	MON 10^9/l	NEU 10^9/l	RBC 10^12/l
1.36	0.14	0.03	8.73
SECOND HEMATOLOGICAL ASSAY			
WBC 10^9/L	MON 10^9/l	NEU 10^9/l	RBC 10^12/l
83.15	6.51	58.19	4.81
FINAL HEMATOLOGICAL ASSAY			
WBC 10^9/L	MON 10^9/l	NEU 10^9/l	RBC 10^12/l
35.33	1.5	12.0	5.7

WBC- White blood cells; MON- Monocytes; NEU- Neutrophils; RBC- Red blood cells

Table 2

Biochemical assays

INITIAL BIOCHEMICAL ASSAY							
BUN mg/dl	Glu mg/dl	ALP IU/L	T-PRO g/dl	ALT IU/L	Cre mg/dl	Alb g/dl	GGT IU/L
29	95	163	5.2	34	1.3	2.2	10
FINAL BIOCHEMICAL ASSAY							
BUN mg/dl	Glu mg/dl	ALP IU/L	T-PRO g/dl	ALT IU/L	Cre mg/dl	Alb g/dl	GGT IU/L
20	95	140	6.0	95	1.0	2.5	10

BUN- Blood Urea Nitrogen; Glu- Glucose; ALP- Alkaline phosphatase; T-PRO- Total Protein; ALT- alanine aminotransferase; Cre-Creatinine; Alb-Albumin; GGT- gamma-glutamyl transferase

rrhagic diarrhoea, suspected of parvovirosis in a 5-months-old mixed breed dog, which implied a complex therapy of 17 days, cited average time period is normally of approximately 7 days (11).

MATERIALS AND METHODS

A 5-months-old unvaccinated mixed breed dog was brought to the Veterinary Hospital of the University of Agricultural Science and Veterinary Medicine in Cluj-Napoca with a history of vomiting and haemorrhagic diarrhoea. During the consult, the patient showed general signs of illness, such as tachypnoea (50 breaths per minute), mild fever (39.5°C), a heart rate of 95 beats per minute, anaemic mucous membranes with a capillary refill time (CRT) of 3 seconds. The dog was lying in lateral recumbency, presented apathy, a persistent skin fold, xerostomia and enophthalmia, signs of severe dehydration. During the palpation of the abdominal area, the dog showed high abdominal sensitivity and kyphosis. The auscultation of the digestive tract revealed the presence of an accentuated peristalsis.

A commercial parvovirus snap test (CPV Ag testing kit, Romania) was used according to the manufacturer's instructions. After local clipping and a thorough disinfection with betadine, a blood sample was collected from the jugular *vena* in EDTA (BD Vacutainer EDTA) and procoagulant vials (BD Vacutainer clot activator) in order to evaluate packed cell volume (PCV) and total solids (TS). The haematological and biochemical assays were carried out on Abacus Junior Vet 5 and Arkray Spotchem ez sp-4430 analyzers, respectively. In order to assess the severity of the digestive tract lesions, an ultrasound (eSaote My Lab) examination was performed.

RESULTS AND DISCUSSION

The results of the rapid identification test proved negative, which can be attributed to the intermittent shedding of the virus through the fecal matter. However, considering the clinical signs, the diagnosis of parvovirosis shouldn't be excluded (7). The initial PCV showed severe leukopenia with monocytopenia, neutropenia and polycythemia (Table 1), these data sup-

Table 3

Treatment days 1-9

	R	D	GEL	METR	VIT C	RAN	ETAM	CAR	METAM	METOCL	SYN
QUANT.	450 ml	150 ml	150 ml	130 mg	1000 mg	25 mg	250 mg	1.5 mg	1000 mg	4 mg	8.75 mg
ROUTE	i.v.	i.v.	i.v.	i.v.	i.v.	s.c.	i.v.	i.v.	i.m.	i.v.	s.c
FREQ.	2x/ day	2x/ day	2x/ day	2x/ day	1x/ day	2x/ day	2x/ day	2x/ day	2x/ day	2x/ day	1x/ day

R- Ringer Solution; D- Duphalyte; GEL- Gelofusine; METR-Metronidazole; VIT C- Vitamin C 10%; RAN- Ranitidine; ETAM-Etamsilate; CAR-Carbazocrom; METAM-Metamizole; METOCL-Metroclopramide; SYN-Amoxicillin/clavulanic acid

Table 4

Treatment days 9-17

	NaCl	DE	METOCL	VIT C	RAN	C/S	ORN
QUANT.	500 ml	130 ml	4 mg	1000 mg	25 mg	520 mg	200 mg
ROUTE	i.v.	i.v.	i.m.	i.v.	s.c	i.v.	p.o.
FREQ.	2x/ day	2x/ day	2x/ day	1x/ day	2x/ day	2x/ day	1x/ day

NaCl - Sodium Clorhide solution; DE - Dextran solution; METOCL - Metoclopramide; VIT C - Vitamin C; RAN - Ranitidine; C/S - Cefoperazone/sulbactam; ORN - Ornithine L-aspartate-L

port the clinical suspicion of CPV infection. (the virus is known to also affect the bone marrow). The initial TS revealed high levels of alkaline phosphatase (ALP), and low levels of total proteins and gamma-glutamyl transferase (GGT) (Table 2). The high ALP value may be due to the young age of the dog (8), whilst the low value of the total proteins could be explained by the presence of bloody diarrhoea (11). No relevance was found in the low level of the GGT (1). A week into the treatment, the analysed parameters were within normal ranges. The dog was shortly referred to the Infectious Diseases Department, where an intravenous fluid treatment was initiated. Anti-haemorrhagic, vitamin and antibiotic therapy was promptly administered, followed by gastric and liver protection treatment, using the dosages specified in the BSAVA Small Animal Formulary 7th edition. The treatment protocol described by each day of treatment is showcased in Table 3 and Table 4. During the first 9 days of treatment, the medication consisted in the administration of multiple drugs, in order to ameliorate the clinical signs. It is worth mentioning that during this period of the treatment, clinical signs have shown to alternate. In the first 4 days, loss of appetite, vomiting and the bloody diarrhoea persisted. In the following 5 days, the diarrhoea stopped but the vomiting was still present. During day 9, even though the patient was still vomiting, it regained its appetite. On the 9th day, a 2nd PCV examination revealed a severe leukemoid syndrome (marked neutrophilia, leucocytosis with a degenerative left shift) alongside a non-regenerative microcytic anaemia (Table 1). CPV infection is frequently associated with leukopenia, acute lymphopenia, neutropenia and monocytosis (5). Knowledge of this particular set of parameters may alert clinicians to the possibility of complications and they can indicate the need for urgent therapeutic actions, even in cases that proved to be negative for CPV rapid antigen testing.

These results suggested that the antibiotic treatment (amoxicillin with clavulanic acid) was not efficient, since presence of neutrophilia marked a chronic process in the organism. For this reason, the initial antibiotic treatment was replaced with a combination of cefoperazone and sulbactam, in dosage of 22 mg/kg IV, BID. Moreover, autohemotherapy was introduced as a non-specific immunostimulatory procedure. A total amount of 5 ml of venous blood was administered subcutaneously for 7 days. In the 13th day of treatment, an abdominal ultrasound was performed. There were no signs of intussusception (a well-known, potentially fatal complication of parvovirus infections), the ultrasound indicated no signs of other complica-

tions but the normal findings in gastroenteritis. The large intestines were motile, fluid filled, with thickened walls (Fig.1). A gastric segment also showed fluid accumulation and thickened mucosa (Fig. 2).

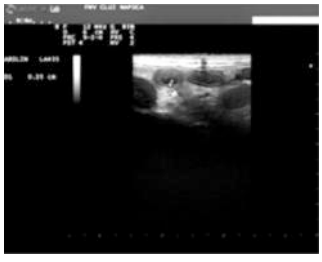

Fig. 1. Ultrasonographic image of the thickened intestinal mucosa

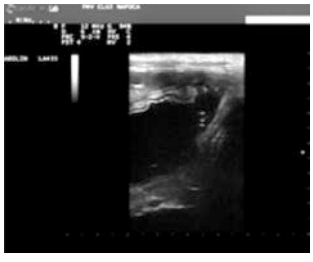

Fig. 2. Ultrasonographic image of the thickened gastric mucosa

Subsequent to the final day of treatment, the clinical signs of parvovirus infection alleviated and the general status of the animal improved considerably. Before discharge, a final set of blood work was performed. A mild leucocytosis was still present, but the red blood cell and neutrophil count were found to be within the normal ranges (Table 1), with marked improvement of the total solids (Table 2).

CONCLUSIONS

Notwithstanding the negative result delivered by the commercial snap test for parvovirus detection, based on the clinical signs, anamnesis and blood assays, the diagnosis of canine infectious gastroenteritis was not excluded. Considering that a bacterial infection invariably leads to an aggravated prognosis, the administration of an effective antimicrobial is of great importance in annihilating the bacterial overgrowth of epiphytic bacteria owed to the immunosuppression associated with the possible presence of the CPV infection. In order to exclude the presence of parasitic and/or bacterial infections, as well as the occurrence of potentially fatal complications, paraclinical examination should be performed in the case of parvoviral gastroenteritis.

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