CLINICAL AND PARACLINICAL ASPECTS IN THE ACUTE DIARRHEAL SYNDROME IN DOGS

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Abstract

The aim of this paper was to identify the clinical and paraclinical diagnostic elements of acute diarrheal syndrome in dogs, useful in streamling of treatment. The clinical diagnosis in haemorrhagical acute diarrheal was easy to establish given the profoundly altered general condition with cortical inhibition and melena; sometimes it has been clinically evolve as dysentery (frequent bloody defecation). In catarrhal acute diarrheal, it can sometimes be profuse (exhausting), accompanied by alteration of the patient's general condition and drowsiness. The ultrasonographical examination revealed inflammation of the intestinal wall with a hyperechoic appearance and a halo exterior hypoechogenic corresponding to parietal congestion. The haematological examination revealed hypochromic, normocytic anaemia and a systemic inflammatory syndrome (increased WBC=17.2±0.3x10³/mm³, decreased RBC=5.3±0.4x10⁶/mm³, HGB=11.8±0.4 g/dl and CHEM=31.0±0.2 g/dl). The blood biochemical examination showed subclinical liver failure without impairment of renal and exocrine pancreas functions. The sero-haemorrhagical acute diarrhea had clinically manifested by cyclic episodes of diarrhea. The radiological examination revealed inflammation of the intestinal mucosa and the presence of superficial ulcers, and the coproparasitological examination confirmed cryptosporidiosis. On the other hands, the sero-haemorrhagical acute diarrhea was the consequence of traumatic gastroenteritis, confirmed by radiological exam (dense, radiolucent contents in the gastrointestinal mass). In this situation, the haematological examination revealed a systemic inflammatory process (increased WBC=18.0±0.3x10³/mm³) and hypochromic, normocytic anemia (decreased CHEM=31.8±0.3 g/dl). The blood biochemical examination revealed subclinical liver failure (increased ALT=88.2±0.3 IU/L and ALP=120.3±0.4 IU/L, values only).

Key words: acute diarrhea, dogs, clinical, paraclinical

Introduction

The functional diarrhea is a typical clinical sign in enteritis, and in the dogs, the enteritis also evolves with clinical signs of gastritis due to the particularities of the digestive tract (Willard M.D. *et al.* 2014; Mortier F. *et al.* 2015).

Clinically, acute diarrheal syndrome in dogs have frequently a haemorrhagic, catarrhal or sero-haemorrhagic appearance, to which have add the common clinical signs of gastroenteritis (Berset-Istratescu C.M. *et al.* 2014; Hall E.J. *et al.* 2010; Davenport D.J. *et al.* 2010). On the other hand, the acute diarrheal syndrome in the dogs have a varied etiology that doesn`t allow it to be addressed by a unitary therapeutic protocol (Hubbard K. *et al.* 2007; Unterer S. *et al.* 2015; Hagiu N. *et al.* 1997). In order to establish the etiological diagnosis and to adopt a curative-prophylactic approach, it is often also necessary to carry out paraclinical diagnostic elements such as laboratory tests (haemolucogram, some parameters of the blood biochemical profile) and imaging investigations (ultrasound, radiography) (Singleton D.A. *et al.* 2019; Minamoto Y. *et al.* 2015).

Thus, the clarification of clinical and paraclinical diagnostic elements in the acute diarrheal syndrome frequently encountered in dogs, facilitates the clinical diagnosis and streamlines the treatment.

Materials and Methods

Research, has been done on dogs of different ages and breeds, showing clinical signs of acute diarrheal syndrome. The clinical diagnostic elements were the consistency and appearance of faeces, the frequency of defecation and the general condition of patient. From this point of view, the acute diarrheal syndrome was haemorrhagic, catarrhal or sero-haemorrhagic.

Subsequently, depending on the clinical diagnosis were performed paraclinical examinations in order to specify the primary disease and to recommend the appropriate

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treatment. For this purpose, were determined the haemoleukogram, some blood biochemical parameters of liver profile – aspartate-aminotransferase (AST), alanine-aminotransferaze (ALT), alkaline phosphatase (ALP), renal profile – creatinine (CRTN), blood-ureea-nitrogen (BUN) (Focak M. *et al*. 2017) and amylase (AMY), the ultrasound, radiological and coproparasitological examination.

For the haematological examination, blood was collected on anticoagulant (EDTA) and were determined RBC (red blood cells), HCT (hematocrit), HGB (haemoglobin), VEM (mean erythrocyte volume), HEM (mean erythrocyte hemoglobin), CHEM (mean erythrocyte hemoglobin concentration), WBC (white blood cells) and PLT (platelets). For these determinations was used the automatic hematology analyzer – *Abaxis Vet Scan HM5*.

For the biochemical examination, blood was collected in test tubes without anticoagulant for the serum expression and was used the automatic biochemical analyzer – *Abaxis Vet Scan VS2*.

The ultrasound examination was performe using the *Acuson NX3 Elite* ultrasound and the probe 5-8 MHz.

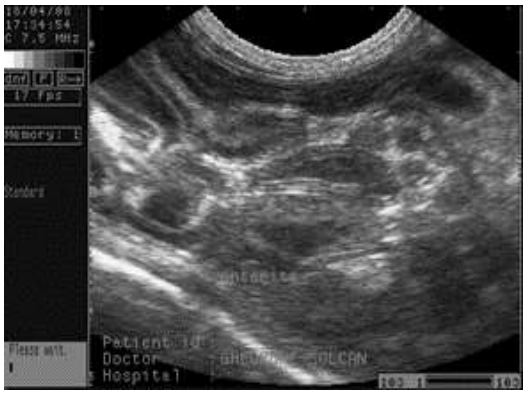
Results

The clinical signs in the haemorrhagic acute diarrhea started with inappetence and retching associated with vomiting and diarrhea with hemolyzed blood (melena). The patient's general condition was profoundly alter, with cortical inhibition (deviation) and pulse with diminished qualities (increased frequency, decreased amplitude and tension). The dehydration was severe (skin fold persisting for more than 60 sec.), the gaze was expressionless, and during examination the posterior train was observed soiled with soft, bloody and foul-smelling faeces (melena).

In some patients, the haemorrhagic acute diarrhea had appearance of dysentery (frequent bloody defecation and profound impairment of general condition). Clinical examination also revealed a thready pulse, inert attitudes, cyanosis and discoloration of the buccal mucosa, hypothermia and traces of soft, bloody faeces remaining on the thermometer.

The clinical signs in the catarrhal acute diarrhea started with inappetence, vomiting, discrete haematuria and catarrhal diarrhea. Later, clinical signs of cortical inhibition (deviation), moderate dehydration (skin fold returning in 50 seconds), tachycardia, cold extremities, elevated rectal temperature and soft faeces mixed with mucus remained after thermometry on thermometer. In some patients, the catarrhal diarrhea was profuse (exhausting), the patient's general condition deteriorated abruptly with repeated vomiting, followed by severe dehydration (skin fold persists over 60 seconds) and profound cortical inhibition (drowsiness).

On the ultrasonographic examination in catarrhal acute diarrhea was observe in which the intestinal loops have a hypoechoic fluid content, inflamed intestinal wall with hyperechogenic appearance and a halo hypoechogenic outside corresponding to parietal congestion. The pyloric mucosa was also thicken with obvious hyperechogenic folds and a hypoechogenic inflammatory halo (catarrhal gastroenteritis) (Figure 1, a, b).



a

b

Figure 1 – Catarrhal gastroenteritis
a - intestinal loops with hypoechoic content;
b -thickened pyloric mucosa

The haematological examination showed increased WBC ($17.2\pm0.3x10^3/mm^3$), decreased RBC ($5.3\pm0.4x10^6/mm^3$) and HGB (11.8±0.4 g/dl) and unchanged HCT and PLT values (Table 1).

The blood biochemical examination showed elevated values of AST (60.8±0.3 IU/L), ALT (178.0±0.4 IU/L), ALP (147.0±0.3 IU/L). At the same time CRTN, BUN and AMY values were within the average reference values (Table 2).

Table 1

Results of the haematological tests in dogs with catarrhal gastroenteritis

Blood parameter	WBC	PLT	RBC	HCT	HGB	VEM	HEM	CHEM
Unit of measuring	mii/µl	mii/µl	mil./µl	%	g/dl	µ³	pg	g/dl
Values of reference (Susan E. *et al.* 1998)	6-17	160-430	5.5-8.5	37-55	12-18	64-74	22-27	34-36
Determined values	17.2±0.3	378	5.3±0.4	38.0±03	11.8±0.4	71.6±03	22.2±0.3	31.0±0.2

Notes: WBC-white blood cells; PLT-Platelets; RBC-red blood cells; HCT-hematocrit; HGB-haemoglobin; VEM-mean erythrocyte volume; HEM-mean erythrocyte haemoglobin; CHEM-mean erythrocyte haemoglobin concentration

Table 2

Results of the blood biochemical tests in dogs with catarrhal gastroenteritis

Blood parameter	AST	ALT	ALP	CRTN	BUN	AMY
Unit of measuring	IU/L	IU/L	IU/L	mg/dl	mg/dl	IU/L
Values of reference (Susan E. *et al.* 1998)	8.9-48.5	8.2-57.3	10.6-100.7	0.5-1.6	8.8-25.9	269.5-1462.4
Determined values	60.8±0.3	178.0±0.4	147.0±0.3	0.9±0.2	12.4±0.2	752.0±0.5

Notes: AST-aspartate-aminotransferase; ALT-alanine-aminotransferase; ALP-alkaline phosphatase; CRTN-creatinine; BUN-blood urea nitrogen; AMY-amylase

Clinical signs in the sero-haemorrhagic acute diarrhea are the appetite present and the general condition slightly altered (listlessness). At long intervals of about 1-2 months, episodes of sero-haemorrhagicaly diarrhea were observe, sometimes even with streaks of non-haemolysed blood.

The radiological examination with contrast medium (barium sulphate) revealed inflammation of the intestinal mucosa and the presence of superficial ulcers. Coproparasitological examination indicated cryptosporidiosis (Figure 2).

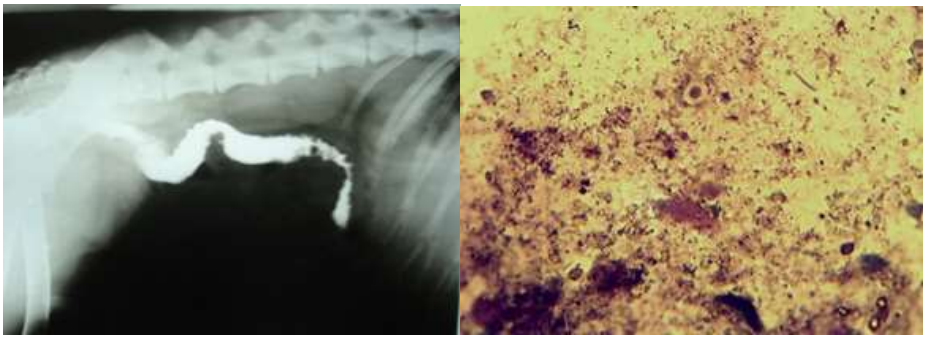


Figure 2 – Superficial intestinal ulcers, Cryptosporidiosis

In some patients, the sero-haemorrhagic diarrhea was the consequence of traumatic gastroenteritis. The clinical examination revealed inappetence, vomiting, alternating periods of watery diarrhea and constipation, abdominal contraction, tachypnea and tachycardia.

The haematological examination showed only an increased WBC (18.0±0.3x10³/mm³), the other haematological parameters determined had values within the physiological limits of the mean reference values. The calculated haematological parameters had values within physiological limits, except for CHEM (31.8±0.3 g/dl) (Table 3).

Table 3

Results of the haematological tests in dogs with traumatic gastroenteritis

Blood parameter	WBC	PLT	RBC	HCT	HGB	VEM	HEM	CHEM
Unit of measuring	mii/µl	mii/µl	mil./µl	%	g/dl	µ³	pg	g/dl
Values of reference (Susan E. *et al.* 1998)	6-17	160-430	5.5-8,5	37-55	12-18	64-74	22-27	34-36
Determined values	18.0±0.3	362	6.2±0.4	44.0±0.3	14.0±0.3	70.9±0.4	22.5±0.4	31.8±0.3

Notes: WBC-white blood cells; Plt-Platelets; RBC-red blood cells; HCT-hematocrit; HGB-haemoglobin; VEM-mean erythrocyte volume; HEM-mean erythrocyte haemoglobin; CHEM-mean erythrocyte haemoglobin concentration

Table 4

Results of the blood biochemical tests in dogs with traumatic gastroenteritis

Blood parameter	AST	ALT	ALP	CRTN	BUN	AMY
Unit of measuring	IU/L	IU/L	IU/L	mg/dl	mg/dl	IU/L
Values of reference (Susan E. *et al.* 1998)	8.9-48.5	8.2-57.3	10.6-100.7	0.5-1.6	8.8-25.9	269.5-1462.4
Determined values	37.8±0.3	88.2±0.3	120.3±0.4	1.0±0.2	18.2±0.2	640.0±0.5

Notes: AST-aspartate-aminotransferase; ALT-alanine-aminotransferase; ALP-alkaline phosphatase; CRTN-creatinine; BUN-blood urea nitrogen; AMY-amylase

On the blood biochemical examination only elevated ALT (88.2±0.3 IU/L) and ALP (120.3±0.4 IU/L) values were obtained. These data indicate a subclinical liver failure without impairment of renal and exocrine pancreas functions (Table 4).

On radiological examination, a dense, radiolucent content was observed in the gastrointestinal mass (Fig.3).

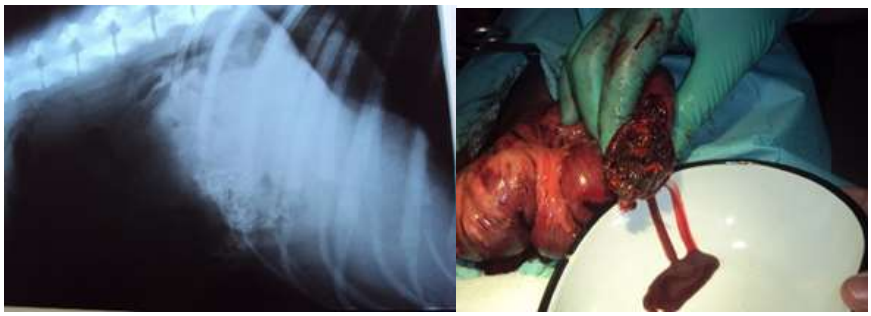


Figure 3 – Traumatic gastroenteritis
(through foreign bodies)

Discussion

In the haemorrhagic acute diarrheal no other paraclinical examinations were necessary to establish the clinical diagnosis and recommend treatment. The data obtained on clinical examination (bloody diarrhea) and anamnesis (lack of prophylactic vaccination) were sufficient to specify the diagnosis of haemorrhagic gastroenteritis, most likely viral in nature.

On the other hands, in the catarrhal gastroenteritis the clinical examination and history which revealed diarrhea, vomiting and the appearance of feces that were soft and mucusy, to which was added the inflammatory syndrome were the data that indicated the clinical diagnosis. At the same time the values of the calculated haematological parameters, namely MEV and MEH were within the limits of the mean reference values and CHEM (31.0±0.2 g/dl) was below the limit of the physiological mean values. These data indicate a hypochromic, normocytic anaemia and an inflammatory syndrome that often accompanies catarrhal gastroenteritis, while the blood biochemical examination indicate subclinical liver failure without impairment of renal and exocrine pancreas functions. This shows the serious evolution of this type of diarrhea.

In the sero-haemorrhagic diarrhea the etiological diagnosis of the primary disease is necessary for the appropriate treatment. Paraclinical examination indicate a systemic inflammatory process, a hypochromic, normocytic anaemia, subclinical liver or a traumatic gastroenteritis confirmed by a radiological examination; in this situation it is recommended surgical treatment.

Conclusions

In the haemorrhagic acute diarrhea, the clinical examination (bloody diarrhea) and the history (patient's age and lack of prophylactic vaccination) are often sufficient to establish the diagnosis and recommend treatment, without further paraclinical examinations. Sometimes, it can evolve as dysentery (frequent bloody defecation) with profound impairment of the general condition.

In the catarrhal acute diarrhea, in addition to the clinical examination, other paraclinical investigations are necessary to clarify the diagnosis, such as ultrasound, haematological or blood biochemical examination, in which case found an inflammatory syndrome or a pathophysiological syndrome of hepatocytolysis (increased serum transaminases). At other times, it may evolve clinically with the appearance of profuse (exhausting) diarrhea and profound cortical inhibition (drowsiness).

In the sero-haemorrhagic diarrhea, the paraclinical diagnostic elements (radiological, coproparasitological) are essential for the aetiological diagnosis (primary disease) and recommendation of appropriate treatment.

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