

EPIDEMIOLOGICAL AND PARACLINICAL ASPECTS IN CANINE DIROFILOARIOSIS

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Summary

The ascending incidence of dirofilariosis in dogs and the potential implications for human health through of the zoonotic character of helminthiasis, is the argumentation for the need for scientific investigation at world level. The clinicians in the field of human pathology signal the presence of nodules in the pulmonary parenchyma, in the conjunctive tissue and in the ocular globe in the Dirofilariosis infestation, lesions that are often taken for neoplastic formations in the radiological examination. According to Italian researchers, pulmonary dirofilariosis is a mosquito transmitted zoonosis. The death of the parasites is followed by an embolemia in the pulmonary capillaries and the presence of the solitary nodules in the parenchyma can be diagnosed in the radiological examination (2).

Numerous researchers have conducted investigations upon the incidence of Dirofilariosis infestation in dogs, with results showing a frequency rate of 50.3%, with the mentioning of the zoonotic aspect of the helminthiasis (3,4,5).

Key words: dogs, paraclinical, epidemiological, dirofilariosis

The ascending incidence of dirofilariosis in dogs and the potential implications for human health through of the zoonotic character of helminthiasis, is the argumentation for the need for scientific investigation at world level. The research has been conducted in Spiru Haret University, Veterinary Medicine Faculty, Parasitology Department from the Veterinary Clinic, on a sample of 52 dogs, of different breeds and ages. The dogs have been examined both clinically and paraclinically: hematological, radiological, electrocardiographical and histopathological examination. Out of the 52 examined dogs, infestation with *Dirofilaria immitis* was diagnosed in 12 dogs (23.07%), by highlighting microfilariae in the peripheral blood. Clinical symptoms of the disease - apathy, weight loss, exhaustion, cough, dyspnea, cardiac insufficiency – were found in only 3 dogs (25%).

The presence of Dirofilariosis infection was identified in 5 dogs aged between 3-5 years, in 5 dogs between 6 –8 years and in 2 dogs between 10-14 years, out of which 8 females and 4 males of the following breeds: 2 Siberian Husky, 4 Labrador, 1 Border Collie, 1 Belgian Shepherd, 2 German Pointer, 1 Pitbull, 1 Cross-breed. The hematological examination showed: cupripriv hipocrom microcitary anemia, neutrophily, lymphocytopenia and eosinophily.

The radiological examination highlighted cardiac hypertrophy with dilatation of the left ventriculus and presence of densification areas in the pulmonary parenchyma. The elecrocadiographic examination (ECG) showed hypertrophical cardiomyopathy.

Histopathological examination has showed pulmonary edema, and distended alveolar capillaries. Macrophage cells with hemosiderin were found among the peribulbar septum and in the conjunctive tissue from the pleura.

Materials and methods

The research has been conducted in Spiru Haret University, Veterinary Medicine Faculty, Parasitology Department, on a sample of 52 dogs, of different breeds and ages.

The dogs have been examined both clinically and paraclinically (hematological, radiological, electrocardiographical and histopathological examination). In 3 dogs showing illness symptoms, the blood examination was conducted using the electronic equipment type ACT 5, DIF, leukocytic formula, biochemical examination (Fe and Cu) determined by spectrophotometrics with atomic absorption, total protein by Weighselbaum method and serum albumins by the method of relating the marker with brom cresol. The histopathological examination was performed on pulmon and cord samples, taken from a dog with a illness with clinical symptoms, which died at the end of the experiment.

Results and discussions

Out of the 52 examined dogs, infestation with *Dirofilaria immitis* was diagnosed in 12 dogs (23.07%), by highlighting microfilariae in the peripheral blood. (table 1). Table 2 shows the degree of infestation and the clinical symptoms in positive dogs.

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Clinical symptoms of illness – cough, dyspnea, progressive weight loss, exhaustion at effort, cardiac insufficiency and ascites – were identified in only 3 (25%) of the infected dogs.

The blood examination performed in 3 dogs with illness symptoms – by leukocytic formula, determination of hematological constants and biochemical determinations – showed cupripriv hipocrom microcitary anemia, neutrophily, lymphocytopenia and eosinophily. HEM and CHEM values were below physiological limits and cupremy was 50% of the physiological value.

Table 1

Incidence of infestation with *D. immitis*

Nr. of examined dogs	Nr. of dogs positive	Percent
52	12	23,07

Table 2

Degree of infestation and clinical symptoms

No.	Breed	Age years	Sex	Degree of infestation	Symptoms
1	Siberian Husky	3	♀	+	-
2	Siberian Husky	14	♂	++	-
3	Labrador	4	♂	+	-
4	Labrador	6	♀	++	-
5	Labrador	6	♀	+	-
6	Labrador	8	♀	+	-
7	Border Collie	8	♀	++	-
8	Belgian Shepherd	5	♀	+	-
9	German Pointer	8	♀	+++	apathy, weight loss, exhaustion, cough, dyspnea, cardiac insufficiency
10	German Pointer	4	♀	+	-
11	Pitbull	5	♂	+++	exhaustion, cough, ascites, cardiac insufficiency
12	Cross-breed	10	♂	++	dyspnea, cough, ascites, cardiac insufficiency

Weak +
 Medium ++
 Massive +++

Table 3

Value of the hematological constants

No.	Hematitis Mil/ μ l	Leukocytis Mil/ μ l	Hemoglobine g/dl	Hematocrit %	VEM	HEM	CHEM
1	5	11	15.4	45	60	19	34
2	4.8	10	15	45	62	20	33
3	5	10.5	15.6	45	60	19	33

Table 3 shows that: the number of blood cells has recorded a low level ranging between 4.8 and 5 million/ μl , the number of leukocytes has kept in the physiological range (10,5 – 11 thousands/ mm^3 of blood), hemoglobin in physiological parameters (15 – 15.4) as for the hematocrit (45%), while the values HEM and CHEM were below the physiological limits.

Table 4**Values of the leukocytic formula**

No.	Neutrophils %	Lymphocytes %	Eosinophils %
1	79	12	9
2	80	13	10
3	78	12	12

Table 5**Values of sanguine biochemical determinations**

No.	Total proteins g/dl	Albumin g/dl	Globulin g/dl	Fe $\mu\text{g/dl}$	Cu $\mu\text{g/dl}$
1	6.79	3.45	3.34	187.8	62.6
2	6.68	3.20	3.28	185.6	63.4
3	6.75	3.35	3.30	188.4	64.5

Table 4 highlights neutrophylis (70-80%), lymphocytopenia (11-13%) and eosinophyly (9-12%). Table 5 shows the values of sanguine biochemical determinations. Total proteins range between 6.68 – 6.79 g/dl, albumin between 3.2 – 3.45 g/dl and globulin between 3.28 – 3.34 g/dl.

Given the fact that the copper is involved in the metabolism of the iron, the dogs with illness symptoms have recorded low level of cupremia (below 50% of the physiological value) and this has negatively influenced the metabolism of iron. The diagnosed anemy has the features of an anemy resulting from lack of iron (1).

The radiological examination highlighted cardiac hypertrophy with dilatation of the left ventriculus and presence of densification areas in the pulmonary parenchyma, developed consequent to the cardiac and pulmonary affections caused by the localisation of the adult parasites. The electrocardiographic examination (ECG) showed hypertrophical cardiomiopathy based on the voltage of the R wave of 2.8 mV in D I, D II, a VR and the over-unleveling of segment S-T in all member derivations.

Histopathological examination has showed pulmonary edema and emphysema, descuamativ bronchiolitis, thrombosis which obstruct the ramifications of the pulmonary artery. Alveolary capillaries are extatic. Inside

perialveolar septa and subpleural conjunctive tissue there are numerous macrophages which fagocitate hemosiderine resulted from the degradation of eritrocites.

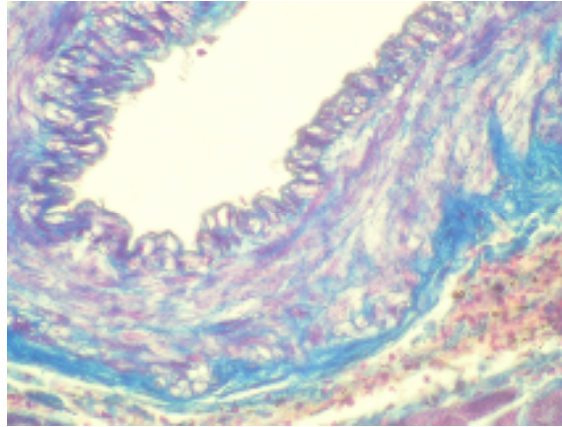


Fig. 1 Endarteritis; Col. tricromic Mallory; Ob. 40x

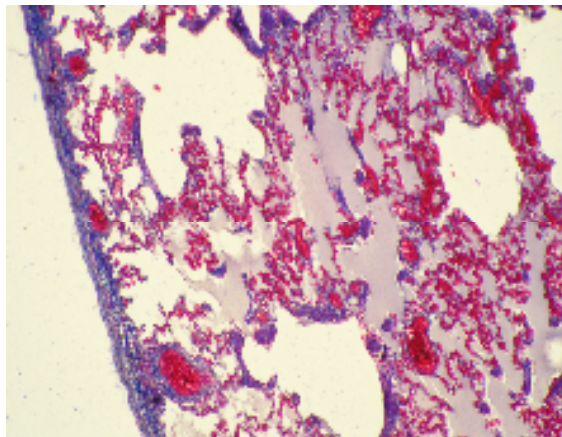


Fig.2- Thromboembolism, pulmonary edema and emphysema; Col. tricromic Mallory; Ob. 10x

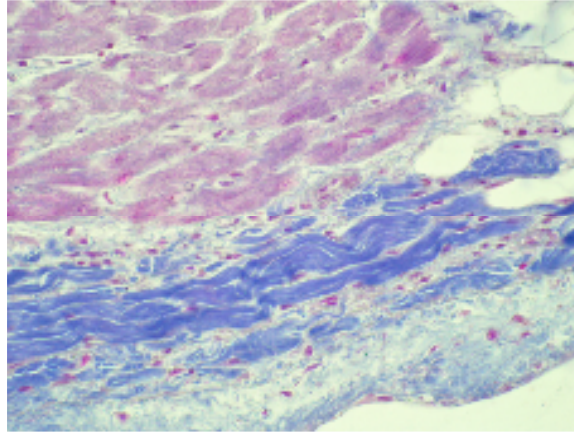


Fig.3 - Subendocardial fibrosis; Col. tricromic Mallory; Ob. 40x

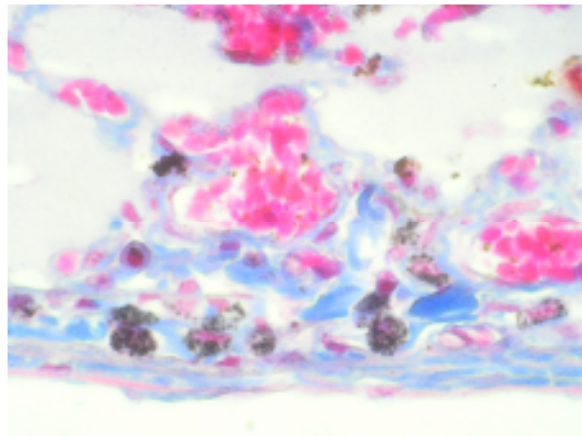


Fig.4 - Macrophags with haemosiderin; Col. tricromic Mallory; Ob. 40x

Conclusions

1. The infestation *D. immitis* was identified in 23 per cent from examined dogs.
2. The hematological examinations has showed cupriptive microcitary anemia, neutrophily, lymphocytopenia and eosinophily.

3. The radiological examination has showed hipetrophy with dilatation of left ventriculus.
4. Histopathological examination has showed pulmonary edema and emphysema, descuamativ bronchyolitis.

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