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Cocker Spaniel cardiomyopathy

Cardiomiopatia do Cocker Spaniel

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SUMMARY

Twenty-eight cases of Cocker Spaniel cardiomyopathy (CM) were studied to determine the epidemiologic, clinic and etiologic characteristics of the disease. The animals were assessed by anamnesis, physical examination, radiographic and electrocardiographic exams. Among the 28 dogs which were examined, 13 were male and 15 female, their age being from 18 to 144 months. The most frequent clinical manifestations observed were exercise dislike, cough, dyspnea and choking, respectively, in 23, 14, 7 and 7 cases. The radiographic exams were possible in 12 dogs and revealed deviation of the trachea (8/12), increase of the right side of the heart (7/12), global cardiomegaly (5/12) and pulmonary interstitium density (4/12). Electrocardiographic assessment, made in all 28 dogs, revealed cardiac frequency changing from 60 to 180 b.p.m. The most frequent cardiac rhythms were sinusal arrhythmia with wandering pacemaker (11/28), normal sinusal rhythm (6/28) and sinusal arrhythmia (5/28); the cardiac axis in frontal plan was normal in 27 out of 28 dogs. Moreover, by the electrocardiographic assessment it was possible to diagnose right ventricular overload (28/28) and left ventricular overload (20/28).

UNITERMS: Cardiomyopathy; Cocker Spaniel; Dogs.

INTRODUCTION

The cardiac muscle injury is frequently seen at Medical Clinic Practice and the myocardium disturbances may be a result of degeneration, infection, trauma, neoplasia, inflammation, toxicosis, ischemia and multisystemic factors[20].

Cardiomyopathy (CM) is a term used to describe certain syndromes of myocardic disfunction, characterized by contractibility, reduction and/or alteration in the ventricular filling and/or cardic arrhythmias, in the absence of valvular disease, congenital malformation heart blood vessels alterations.

The cardiomyopathy may be classified in primary (idiopathic) and secondary, and according to the World Health Organization, the primary form may still be classified in three categories: congestive or dilated, hypertrophic and restrictive. In dogs, not only idiopathic cardiomyopathy is described, but also the secondary cardiomyopathy[19].

Among the idiopathic cardiomyopathy, the dilated or congestive cardiomyopathy should be remarked, as well as the Boxer cardiomyopathy and the hypertrophic cardiomyopathy. The former is characterized by dilation and decrease in ventricular contractibility. It affects large and giant breeds, male dogs mainly. In the clinical point of view it is characterized by asthenia, lethargy, dyspnea, exercise dislike, anorexia, weight loss, ascites and syncope. Electrocardiographically, the cardiac rhythm is the atrial fibrillation in general and later premature ventricular contractions. The echocardiographic exam is very important to assess the cardiac chambers sizes and the myocardium contractibility[1,2,9,16].

The Boxer cardiomyopathy was at first described by Harpster[8] (1983) and differs from the dilated form observed in large and giant breeds; the cause of the former is unknown, but it seems to have an inherited component envolvement. There is a sex predisposition, that is, the males are more frequently affected than the females[8,12]. The animals present syncope and asthenia episodes; clinical manifestations may be followed by left or bilateral cardiac failure; however, many affected dogs are assymptomatic when diagnosed. The main characteristics of this cardiomyopathy type is the presence of a cardiac arrhythmia that may be the only clinical sign in the assymptomatic animals. Electrocardiographically, sinusal rhythm, atrial fibrillation or other tachyarrhythmias may be detected; ventricular premature contractions are the characteristics which may occur in separate, in doubles or in

groups or else characterized as a ventricular tachycardia[8,12,20]. The echocardiographic exam may reveal normal or increased ventricular dimensions and normal or decreased myocardic contractibility[20].

The hypertrophic cardiomyopathy in dogs is rare, being in general secondary to hypertension, associated to kidney diseases[20] and characterized by asymmetric hypertrophy of interventricular septum[13].

In the Medical Clinical Practice, more especifically in the Cardiology Assistance, we have often remarked that Cocker Spaniel dogs present cardiopathy and some of them have cardiac failure signs.

In rewieving specific literature, 5 articles related to the subject in question were found[5,6,7,16,18].

The first work in reference to this subject is one of Staaden[16] (1981), in which the researcher describes a cardiomyopathy, in nearly 50% of the Cocker Spaniel breed dogs, belonging to the same kennel. The same author also detected pulmonary edema and cardiomegaly when necropsying some dogs. Coughing dyspnea and other congestive cardiac failure signs are the clinical referred ones. According to Gooding *et al.*[5,6] (1986) and Thomas[18] (1987), the Cocker Spaniel CM may be classified as the congestive type. Although its etiology is unknown[7], there seems to be a narrow family correlation among the affected animals[16,18].

The aim of this work is to determine the epidemiologic, clinic and etiologic characteristics of this cardiomyopathy, which has been diagnosed in Cocker Spaniel dogs.

MATERIAL AND METHOD

Twenty-eight (28) Cocker Spaniel dogs, referred to the Cardiology Service of the Department of Medical Clinic (Faculty of Veterinary Medicine and Zootechny University of São Paulo), were followed up from October/1990 to September/1991.

The animals were assessed by:

a) Anamnesis: it was asked about their previous sicknesses, the beginning and duration of the symptoms and/or signs, all the organic systems processes, dietetical-hygienic management, previous therapy and animal's origin.

b) Physical examination: it consisted of taking respiratory and cardiac frequencies as well as body temperature. Thorax was mainly examined through inspection, palpation, percussion and indirect auscultation; palpation and abdominal percussion were also performed.

c) Radiographic examination: whenever possible it was performed in THUR D 800-1 X-ray equipment. They use a technique which connects milleamperage/second and kilovoltage to the thickness of the thoracic region[3]. X rays in the latero-lateral and dorso-ventral positions were performed at the end of inspiration, having the animal still and positioned with assistance of helpers.

d) Electrocardiographic exam: it was performed without anesthesia, keeping the animals in the right lateral position, having the bipolar I, II and III leads registered and the unipolar augmented avR, avL and avF leads registered as well as the precordial ones[4,10,19]. A FUNBEC model ECG-40 electrocardiograph was used.

In case it was needed, some complementary exams were performed: hemogram, urinalysis, faeces exam, clinical biochemistry, according to Sociedade Paulista de Medicina Veterinária[15] (1982) and circulating microfilaries research according to Otto; Jackson[14] (1983).

Table 1
Clinical manifestations presented by Cocker Spaniel dogs suffering from CM. São Paulo, 1992.

Clinical manifestations	Frequency
Exercise dislike	23
Cough	14
Dyspnea	7
Chocking	7
Rough respiration	3
Faint	2
Crackles	2
Cyanosis	2
Mitral and tricuspid murmur	1
Pulmonary sounds decreasing	1
Asymptomatic	2

RESULTS

Among the 28 dogs examined, 13 were male and 15 female, their age varying from 18 to 144 months.

In reference clinical manifestations the remarks are mentioned in Table 1.

From the 28 animals studied, radiological exams were possible in 12, that is aproximately 50% of the cases. The radiographic alterations remarked in such animals are summarized in Table 2.

In relation to the electrocardiographic assessment, the cardiac frequency in the 28 dogs examined charged from 60 to

Table 2
Radiographic alterations presented by Cocker Spaniel dogs suffering from CM. São Paulo, 1992.

Radiography alterations	Frequency
Deviation of the trachea	8
Increase of the right side of the heart	7
Global cardiomegaly	5
Pulmonary interstitium density	4
Air bronchogram	2
Caudal lobes densification	1
Hilar region densification	1

Table 3
Cardiac frequency values observed in Cocker Spaniel dogs suffering from CM. São Paulo, 1992.

Cardiac frequency (b.p.m.)	Frequency
100	8
120	6
140	4
180	2
60-80	2
80-100	2
100-120	2
80	1
160	1
Total	28

180 b.p.m., being 100 b.p.m., the most frequent cardiac frequency observed (8 cases).

On analysing the electrocardiographic registers, the most frequent cardiac rhythm associated to the Cocker Spaniel CM is the Sinusal Arrhythmia (Table 4).

Table 5 shows the results obtained in relation to the cardiac axis in the frontal plan.

Moreover, in the electrocardiographic diagnosis it was possible to verify a right ventricular overload by observing the deep Q waves and/or deep S waves in 28 and 2 cases, respectively. In the same way, a left ventricular overload was diagnosed by observing the QRS complexes greater than 0.07s and/or R waves greater than 2.5mV in 16 and 16 cases, respectively.

DISCUSSION

Epidemiological and clinical observations suggest that the Cocker Spaniel CM differs from the one frequently observed in large and giant breeds. Thus, the present paper has diagnosed CM in Cocker Spaniel dogs aged 18 to 144 months, but 60.7% (17 out of 28 dogs) were older than or the same as 7 years old. This observation is quite similar to Gooding *et al.*[7] (1982) who have diagnosed CM in Cocker Spaniel breed aged from 14 to 132 months.

It is also know that either dilated or congestive CM affects the males more frequently than females[1,2,11,17], such fact not being observed in this study, where of 28 affected dogs 13 were male and 15 female. Similarly, when Staaden[16] (1981) described the first 11 cases of CM in Cocker Spaniel dogs, he diagnosed them in 6 males and 5 females, as well as Gooding *et al.*[5] (1986) reported the disease in 17 Cocker Spaniel dogs, being 7 males and 10 females.

In reference to the clinical manifestations shown by animals suffering from this kind of CM, the most frequent were exercise dislike and cough, which are the same as those mentioned by Thomas[17] (1987).

Table 4
Cardiac rhythms presented by Cocker Spaniel dogs suffering from CM. São Paulo, 1992.

Cardiac rhythm	Frequency
Sinusal Arrhythmia + WPM*	11
Normal Sinusal Rhythm	6
Sinusal Arrhythmia	5
Sinus Arrest + WPM	13
Sinus Arrest + WPM + 1st AVB**	1
Sinus Arrest +1st AVB	1
Sinus Arrest	1
Total	38

* WPM: wandering pacemaker
** 1st AVB; 1st atrioventricular block

Table 5
Cardiac axis in the frontal plan presented by Cocker Spaniel dogs suffering from CM. São Paulo, 1992.

Cardiac axis	Frequency
$+60^0$ $+90^0$	18
$+90^0$	6
$+30^0$ $+60^0$	2
$+60^0$	1
0^0	1
Total	28

Radiographic findings showed that the two most common alterations associated with this cardiopathy were elevation of the trachea, increase in the heart cranial and right wall, respectively observed in 8 and 7 dogs from a total of 12, which were assessed by this semiological way. In addition to this radiography exam, it was also possible to diagnose congestive signs as air bronchogram in 2 animals, and hilar region densification in 1 dog. Similar results were obtained by Thomas[18] (1987), who noticed cardiomegaly and elevation of the trachea in all the animals[8] and pulmonary edema with air bronchogram in 7 of them.

From the electrocardiographic point of view, the cardiac frequency observed in the dogs studied in the present paper varied from 60 to 180 b.p.m. being 100 b.p.m. the most common cardiac frequency (Table 3). The single report which refers to the cardiac frequency in the Cocker Spaniel dogs suffering from CM is the one presented by Thomas[18] (1987) where the researcher describes 8 cases of CM, all of them in young animals having signs of severe congestive cardiac failure. Acoording to the author, the observed cardiac frequency in these cases varied from 140 to 200 b.p.m. The cardiac rhythm mainly observed in this paper was the sinusal one (Table 4), that is different from the one observed by

Thomas[18] (1987) in 5 animals, from a total of 8, having supraventricular tachyarrhythmia.

Except for one case, the others presented the cardiac axis in the frontal plan within the normal parameters. Exception refers to an animal which presented an axis similar to 0°, when Thomas[18] (1987) described 8 cases of Cocker Spaniel CM he found normal cardiac axis in all of them, whereas Gooding *et al.*[7] (1982) found most of the dogs with normal axis. On the other hand, this author also found deviations not only to the right but also to the left.

In addition to the electrocardiographic exam, there was a continuous observation in detecting deep Q waves (28/28) that is compatible, according to Hill[10] (1971); Edwards[4] (1983) and Tilley[19] (1992), with the diagnosis of right ventricular hipertrophy. On the other hand, it was possible to diagnose left ventricular hipertrophy by controlling 16 dogs with QRS complexes ≥ 0.07s and/or 6 with R waves ≥ 2.5 mV 4.19.

The CM in Cocker Spaniel differs from that congestive form of CM observed in large and giant breeds. The characteristics presented by the first one show more benign manifestations and a slower evolution, because the affected animals present a long asymptomatic period[6]. Confirming this, Gooding *et al.*[7] (1982), diagnosed this type of CM in 26 asymptomatic animals. On the other hand, the congestive or dilated CM always has a quick evolution. The Cockers affected by CM may live long, as far as they overcome the congestive cardiac failure episodes mainly the left one[6,18]

This fact was also studied in the present work, where pulmonary edema in 2 cases were diagnosed, without even detecting one true case of right congestive cardiac failure.

Another divergence between the two forms of CM refers to the large and giant breeds often associated to atrial fibrillation16, that is rarely seen in Cocker Spaniel CM.

According to Gooding *et al.*[7] (1982), the Cocker Spaniel CM may be characterized at first as hypertrophic, then developing into a dilated form. The obtained results in the present study do not allow us to classify the CM affecting Cocker Spaniel dogs, either as being hypertrophic or dilated, because the echocardiographic exam was performed in one case only.

In relation to the etiology characteristics of this study nothing can be concluded, in spite of Thomas[18] (1987) suggesting a probable hereditary factor.

RESUMO

Estudaram-se no presente trabalho 28 casos de cardiomiopatia (CM) do Cocker Spaniel, com a finalidade de determinar as características epidemiológicas, clínicas e etiológicas da doença. Para tanto, os animais foram avaliados por meio de anamnese, exame físico, exame radiológico e eletrocardiograma. Dos 28 animais, 13 eram machos e 15 fêmeas, com idade variando entre 18 e 144 meses. As manifestações clínicas mais freqüentemente associadas com este tipo de CM foram intolerância ao exercício, tosse, dispnéia e engasgo, observados, respectivamente, em 23, 14, 7 e 7 casos. O exame radiográfico foi realizado em 12 animais e revelou como alterações mais comuns: desvio dorsal de traquéia (8/12), aumento da parede cranial e direita do coração (7/12), cardiomegalia global (5/12) e aumento do interstício pulmonar (4/12). O exame eletrocardiográfico revelou freqüência cardíaca variando entre 60 e 180 b.p.m. Os ritmos cardíacos mais freqüentes foram arritmia sinusal associada a marcapasso migratório (11/28), ritmo sinusal normal (6/28) e arritmia sinusal (5/28); o eixo cardíaco no plano frontal mostrou-se dentro da normalidade na maioria dos casos (27/28); o eletrocardiograma revelou, ainda, sobrecarga ventricular direita (28/28) e sobrecarga ventricular esquerda (20/28).

UNITERMOS: Cardiomiopatia; Cocker Spaniel; Cães.

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