

197) and without annular hypoplasia (69 mmHg range 17–210) had a significant reduction in gradient 24 hours post PBV. It remained significant at 30 days (with annular hypoplasia: 77 mmHg, range 30–116; without annular hypoplasia: 61 mmHg, range 22–193; $P < 0.0001$ for both). When comparing to baseline, considering valve type, there was no significant difference in percent reduction in gradient for type A versus type B valves at both the 24-hour (A: 58%, range 17–88; B: 48%, range 12–82; $P = 0.1014$) and 30-day (A: 43%, range 23–89; B: 58%, range 33–81; $P = 0.0544$) recheck evaluation time points. Additionally, there was no significant difference in gradient reduction when looking only at whether or not there was annular hypoplasia at 24 hours (yes: 57%, range 24–78; no: 49%, range 17–89; $P = 0.2673$) and 30 days (yes: 48%, range 25–81; no: 47%, range 22–89; $P = 0.4695$). In conclusion, classification of dogs with PS according to valve type and annulus morphology did not help predict the 30-day response to PBV.

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ESVC-P-11

PREVALENCE OF HYPERTROPHIC CARDIOMYOPATHY (HCM) IN FELINE POPULATION EXAMINED BY THE OSSERVATORIO ITALIANO HCM FELINA. M.E. Giorgi¹, F. Biretoni¹, P. Ferrari², P. Knafelz³, M. Rishniw⁴, D. Caivano¹, A. Cala², M. Longeri⁵, F. Porciello¹. ¹Università degli studi di Perugia, Perugia, Italy, ²Clinica Veterinaria Orobica, Bergamo, Italy, ³Ospedale Veterinario Gregorio VII, Roma, Italy, ⁴College of Veterinary Medicine, Cornell University, Ithaca, NY, USA, ⁵Dipartimento Scienze Veterinarie e Sanità Pubblica, Università di Milano, Milano, Italy

Hypertrophic Cardiomyopathy (HCM) is the most common feline inherited cardiac disease and it is a major cause of morbidity and mortality. The Osservatorio Italiano HCM Felina was formed in 2008 by a network of clinicians, geneticists and breeders, to monitor and study HCM in Italian cats.

Since April 2008, 1308 adult cats, belonging to various breeds, including Maine coon, Siberian, Norwegian Forest Cats, Ragdoll, Sphynx, British SH, Birman and others have been prospectively enrolled. Recheck evaluations were performed in 287 cats. Each cat underwent a clinical examination, echocardiography, and blood collection for genetic testing (when appropriate) and storage in the Italian Feline Bio-bank.

The disease status was defined by echocardiography according to established guidelines (left ventricular diastolic wall thickness < 5.5 mm = HCM negative, $= 5.5$ but < 6 mm = HCM equivocal; $= 6$ mm = HCM positive).

The prevalence of HCM in the population was 6% (74 cats); equivocal diagnoses were conferred on 4% (57 cats). These prevalences did not differ between breeds. The prevalence of HCM in the Italian feline population was lower compared to those reported by other investigators.

Evaluation of data from the entire population demonstrated that left ventricular end-diastolic wall thicknesses and aortic diameter showed a weak positive correlation with body weight ($P < 0.0001$, $r^2 < 0.12$ for all variables), suggesting that weight-dependent limits on wall thickness should be considered in cats as is currently practiced in dogs.

The lower prevalence of HCM in Italian cat breeds compared with those examined elsewhere might be explained by different criteria for determining presence or absence of disease, differences in ages at which the subjects were examined, or a selection bias by breeders in presenting cats they consider 'normal'.

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ESVC-P-12

EPIDEMIOLOGICAL CHARACTERIZATION OF A PORTUGUESE POPULATION OF DOGS WITH CANINE CHRONIC MITRAL VALVE DISEASE: 542 CASES. L. Lobo¹, G. Petrucci¹, M. Domingues². ¹Hospital Veterinário do Porto, Porto, Portugal, ²Universidade Lusófona de Humanidades e Tecnologias, Lisboa, Portugal

Chronic mitral valve disease is by far the most common cardiovascular disease in dogs. The disease is caused by myxomatous degeneration of the mitral valve leaflets and, in approximately 30% of cases, it's accompanied by degeneration of the tricuspid valve. It is also described in previous studies that approximately 14% of affected dogs also have evidence of associated pulmonary arterial hypertension.

The prevalence of the disease is higher in small breed dogs (under 20Kg), although large breeds can also be affected and it occurs more frequently in males than in females.

The present study aims to characterize the disease in a population of dogs in Portugal. We retrospectively reviewed the medical records of dogs presented to Hospital Veterinário do Porto, with an echocardiographic diagnosis of canine chronic mitral valve disease, during a period of 13 years.

From this records, 542 cases were identified, from which 331 (61.1%) were males and 211 (38.9%) were females. Most of the dogs were mixed breed (215) and 48 different breeds of dogs were represented. The Poodle was by far the most represented breed ($n = 101$; 39.7%), followed by English Cocker Spaniel (18.6%), Yorkshire Terrier (2.8%), Boxer (2.6%), Épagneul Breton (2.6%), Dalmatian (2.4%), Pekingese (2.4%), Labrador Retriever (2%) and Portuguese Podengo (1.8%). All other breeds represented 16.2% of the population.

Regarding weight, 79.8% of the dogs ($n = 395$) weighted < 20 kg, with a mean body weight of 13.45 kg (range 1.6–62 kg). The mean age at diagnosis was 11.34 years old.

We also observed that 42.1% of the dogs ($n = 278$) had concomitant degeneration of the tricuspid valve and 19.4% ($n = 105$) pulmonary arterial hypertension (PH). We categorized these dogs according to the severity of PH, in mild PH if they had a Doppler echocardiography derived systolic pulmonary arterial pressure (SPAP) of 30–50 mm/Hg, moderate PH (SPAP 51–75 mm/Hg) and severe PH (SPAP > 75 mm/Hg). We found that 72.7% ($n = 72$) of dogs had mild PH; 19.2% ($n = 19$) moderate PH and 8.1% ($n = 8$) severe PH.

As described in previous studies, the disease affects mainly males and small breed dogs, with a breed distribution that reflects the canine population in the country, including very including very popular large breed dogs in Portugal, as the Boxer and Labrador.

Both the presence of concomitant tricuspid valve disease and PH had a higher prevalence in our study than previously described.

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ESVC-P-13

ANEMIA IN DOGS WITH MITRAL VALVE DISEASE: PREVALENCE AND ASSOCIATED RISK FACTORS. C. Locatelli¹, A. Savarese¹, E. Martinelli¹, P. Scarpa¹, S. Paltrinieri¹, P.G. Brambilla². ¹University of Milan, Milan, Italy, ²Xxxx, Italy

In people anemia is frequent in patients with heart failure (HF) and it is associated with poor outcomes. The most likely pathogenic factors include iron deficiency, chronic kidney disease (CKD), and cytokine production, although other factors may contribute. Little is known about the prevalence of anemia in dog with cardiovascular disease.

The aim of this retrospective study was to define the prevalence of anemia (Hct $\leq 37\%$) in dogs with mitral valve disease (MVD) and to investigate associated risk factors (age, weight, azotemia, HF, IRIS/ACVIM class).

Medical records of dogs presented at the Cardiology Service, DIVET, University of Milan (January 2003 - March 2015) were retrospectively evaluated. Dogs with MVD with complete physical, thoracic and echocardiographic examinations, and serum biochemical panel, including serum creatinine (sCr), were included in the study. Dogs with other heart or systemic diseases, except CKD, or neoplasm were excluded. Statistical analysis was performed using JMP 12.0 (SAS Institute). A p value < 0.05 was considered significant.

Two hundred and ninety dogs (161 males/129 females), 11.6±2.9 years of age, 12.5±9.2 kg of body weight fulfilled the inclusion criteria. The 22% of males and the 30% of females were neutered. The most represented breeds were mongrel (40%), miniature Poodle (12%), York Shire Terrier (7%), and Cavalier King Charles (5%). Dogs were 29% B1, 13% B2, 54% C and 4% D ACVIM class. While the 72% of the dogs were normoazotemic (sCr <1.4 mg/dl), 13.5% were staged in IRIS 2, 13% in IRIS 3 and 1.5% in IRIS 4.

The prevalence of anemia in dogs with MVD was 17% (50/290): 40 showed mild (30 ≤ Hct ≤ 37%) and 10 moderate (20 ≤ Hct ≤ 29%) anemia. Sixteen dogs were in B1, 5 in B2, 27 in C and 2 in D ACVIM class; 34 were normoazotemic (68%). Anemic dogs showed a significant higher sCr. Normoazotemic dog showed significant higher Hb, Hct and RBC both in the overall population and in the anemic group. In the overall population dogs in different IRIS class showed statistically different Hb, Hct and RBC and Hb was significantly lower in decompensated HF dogs.

In conclusion although a relationship between anemia and azotemia/CKD was documented in our study, it is important to emphasize that most of the anemic dog were normoazotemic: anemia is not an exclusive finding of cardiorenal syndrome and should be considered as possible complication in dogs with MVD alone.

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ESVC-P-14

LEFT ATRIAL DYSFUNCTION IN DOGS WITH SYMPTOMATIC CHRONIC MITRAL VALVE DISEASE. M. Mantovani, J.R. Castro, A.M. Gimenes, L.C. Petrus, C.N. Duarte, M. Ueda, P.H. Itikawa, B. Real, L.F. Beccari, G.T. Goldfeder, M.H.M.A. Larsson, D. Schwartz. School of Veterinary Medicine and Animal Science, University of São Paulo, Sao Paulo, Brazil

The objective of this study was to evaluate left atrial (LA) function by left atrial total fractional area change (LA-FACtotal) and left atrial ejection fraction (LAEF) in dogs affected with chronic mitral valve disease (CMVD) naturally acquired with and without congestive heart failure (CHF). Our hypothesis was that LA-FACtotal and LAEF decrease with severity of CMVD. Eighty dogs were included in a prospective observational cross-section clinical study, grouped according to CMVD severity based on echocardiographic evaluation and clinical signs. The dogs were equally distributed in each group: A, B1, B2 and C, according to American College of Veterinary Internal Medicine staging system. Indicators of LA function were calculated with the following equations: LA-FACtotal = 100 × (LAmaximum area - LAminimum area)/LAmaximum area, measured by apical 4 view; and LAEF = 100 × (LAmaximum volume - LAminimum volume)/LAmaximum volume, by biplane area-length method from the left apical 4 and 2-chamber views. LA-FACtotal showed lower values ($P < 0.0001$) in group C (31.88%, P25–75% = 26.47–41.12) compared with groups A (52.75%, P25–75% = 48.08–56.07), B1 (48.38%, P25–75% = 42.57–51.91) and B2 (46.15%, P25–75% = 41.17–50). Group C had lower LAEF (40.69%, P25–75% = 34.89–52.09) than groups A (68.12%, P25–75% = 64.96–69.91), B1 (58.72%, P25–75% = 52.25–64.60) and B2 (56.98%, P25–75% = 52.08–61) ($P < 0.0001$). Left atrial function, assessed by LA-FACtotal and LAEF, was reduced in dogs with CMVD and CHF compared with healthy and asymptomatic CMVD groups.

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ESVC-P-15

CARDIORENAL SYNDROME IN DOGS WITH MITRAL VALVE DISEASE: A PROSPECTIVE STUDY. E. Martinelli¹, P. Brambilla², C. Locatelli², S. Crosara¹, A.M. Zanaboni², C. Quintavalla¹. ¹University of Parma, Parma, Italy, ²University of Milan, Milan, Italy

Recurrent episodes of heart and/or kidney failure are considered one of the causes leading to worsening heart/renal functions in

human patients. The aim of this prospective study was to assess the influence of heart/kidney worsening on elected parameters of heart/kidney function in dogs affected by mitral valve disease (MVD).

Between July 2012 and May 2013, dogs affected by MVD in ACVIM class B2 and without comorbidities were included in the study group. The control group was constituted by healthy dogs, matched with the cases for age (older than 6 years) and gender.

All the dogs underwent physical examination, thorax radiography, ECG, echocardiography, systemic blood pressure assessment, a complete blood count, serum biochemical analysis, including assessment of serum creatinine (sCr), serum urea nitrogen (UREA) and glycaemia (GLY) and urine analysis with urine protein/creatinine ratio (UPC). Dogs were re-evaluated every 6-month until October 2014. Statistical analysis was performed using IBM SPSS Statistics 20 (p value significant if <0.05).

Twenty-one dogs affected by MVD (cases) were included and 20 healthy dogs (controls) were randomly selected among the eligible population. The 33% of cases experienced at least one episode of congestive heart failure (CHF), but none of these patients developed chronic kidney disease (CKD). The 14% of cases developed CKD while remaining in ACVIM class B2. No dogs in the control group developed CKD or MVD. Correlations between worsening renal function (WRF - sCr elevation ≥0.3 mg/dl or 25% from baseline), furosemide administration, UPC levels, radiographic parameters of heart enlargement and echocardiographic parameter were investigated. Only a statistically significant difference in IRIS class between the groups according to WRF and in the echocardiographic parameter left atrium to aortic root (LA/Ao) according to furosemide amount were observed. Both these results were expected. None of the cases included experienced renal damage (WRF or IRIS class change or UPC change) concomitant to episodes of CHF. The persistence of normal renal condition regardless of CHF events and therapy administration was unexpected. In conclusion, experiencing CHF seems not to directly affect renal function. To authors' opinion, the use of WRF, better than single sCr and UREA levels, may be useful in the long term management of aged patients affected by MVD. However, the small number of cases included in this study represents a great limit. We consider this work a pilot study.

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ESVC-P-16

PREVALENCE OF HYPERTROPHIC CARDIOMYOPATHY ON A POPULATION OF 150 CATS. M.M. Monzo¹, L. Rubens², L. Lobo³. ¹CardioCare, Lisboa, Portugal, ²Hospital Veterinário de Massamá, Lisbon, Portugal, ³Hospital Veterinário do Porto, Porto, Portugal

Hypertrophic cardiomyopathy (HCM) is a primary myocardial disease characterized by inappropriate thickening of the myocardium in absence of other causes of hypertrophy including Hypertension, Hyperthyroidism, aortic stenosis and acromegaly. It is also the most common heart disease in cats. HCM presents a wide variety of clinical signs depending on the severity and location of the hypertrophy.

Cats affected with HCM have a mean age of 5.5–6.5 years old at the time of the diagnosis however this disease can affect cats as young as 3 months although this later age is unusual

HCM is a heterogeneous disease both in terms of phenotypic degree of hypertrophy and clinical outcome. Hallmark histopathological hallmarks lesions of HCM are myocyte disarray, small coronary arteriosclerosis and interstitial fibrosis replacement

In order to confirm HCM echocardiography has to be made. Primary hypertrophy diagnosis is made based on the presence of ventricular hypertrophy, symmetric or asymmetric, in the absence of systemic disorders.

The purpose of this study was to assess the prevalence of HCM in a feline population. In order to achieve this goal echocardiograms were made in all cats older of 6 years clinically asymptomatic with or without cardiac murmur. All echocardiograms were made according to the guidelines of the ACVIM published in 1993. Diagnosis of ventricular hypertrophy was made from the right parasternal window using the B mode to measure the diameter of the LVFW and the IVS in diastole. Cats with more than