Occurrence of Hypertrophic Cardiomyopathy in a Large Cohort of British Shorthair Cats
Granström, Sara Magdalena Rebecca; Godiksen, Mia Titine Nyberg; Christiansen, M.; Willesen, Jakob; Koch, Jørgen

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## Research Abstract Program of the 2010 ACVIM Forum

Anaheim, California,  
June 9 – 12, 2010  
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### Small Animal – Cardiology

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6:00 pm 180 Jevan Christie | Fecal Sensitivity as a Tool to Differentiate Between Non-Neoplastic and Neoplastic Spirocercus lupi Nodules Using a Modified Centrifugal Flotation Method

POSTER PRESENTATIONS

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SMALL ANIMAL – CARDIOLOGY

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182 Maria Helena Larsson | Time Domain High-Resolution Electrocardiography in Boxer Dogs With Arrhythmogenic Right Ventricular Cardiomyopathy and Dilated Cardiomyopathy

183 Aparecido Camacho | Heart Rate Variability in Boxer Dogs With Arrhythmogenic Right Ventricular Cardiomyopathy

184 Denise Schwartz | Six Minute Walk Test Standardization for Dachshund, Poodle and Labrador Retriever Dogs

185 Aparecido Camacho | Effects of Treadmill Training Over Autonomic and Hemodynamic Functions in Healthy Dogs

186 Masashi Mizuno | Effects of Running on the Renin-Angiotensin-Aldosterone System in Dog

187 Sara Granström | Occurrence of Hypertrophic Cardiomyopathy in a Large Cohort of British Shorthair Cats

188 Aparecido Camacho | Clinical Characterization of Hypertensive Hypertrophic Cardiomyopathy in Dogs With Chronic Kidney Disease (CKD)

189 Aparecido Camacho | Heart Rate Variability in Dogs With Mitral Endocardiosis or Newborn Morbid Obesity

190 Carley Saelinger | Comet-Tail Artificial in Normal Dogs and Dogs With Cardiogenic Pulmonary Edema

191 Takashi Ebisawa | Clinical Usefulness of Measuring Plasma Atrial Natriuretic Peptide Concentrations for Assessing the Severity of Dogs With Degenerative Mitral Valve Disease

192 Pierre Menaut | Circulating Natriuretic Peptides Concentrations in Hyperthyroid Cats

193 Caryn Reynolds | Weekly Variability of Plasma NT-proBNP Measurements in Cats With and Without Heart Disease

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195 Carolina Carlos Sampedrano | Effects of High Versus Normal Salt Diets on Cardiovascular Variables in Healthy Aged Cats: A 6-Month Study

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197 Shigeki Yamano | Endogenous Erthythropoietin Levels and Iron Utilization in Dogs With Degenerative Mitral Disease

198 Yoko Fuji | Prevalence of Right to Left Shunt Due to Patent Foramen Ovale Concurrent with Pulmonary Stenosis in Dogs

199 Meg Sleeper | Dobutamine Stress Testing in Portuguese Water Dogs With Juvenile Dilated Cardiomyopathy

200 Sabine Riesen | Pharmacokinetics of Oral Ixabradine in Healthy Cats

201 Michael Katz | Thiamylal Anesthesia Reveals Premonitory Role for the Central Mechanism of Respiratory Sinus Arrhythmia in the Dog

202 Lauren Calland | In-Hospital Electrocardiograph Versus 24-Hour Holter Monitor for Assessing Heart Rate in Dogs With Atrial Fibrillation

203 Ashley Saunders | Bradysysthythmias Requiring Pacemaker Implantation in Chagas Positive Dogs

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205 Silvia Lucas | Evaluation of Oxidant/Antioxidant Total Status and Erythrocyte Antioxidant Defense in Cats With Lymphoma

206 Elizabeth Lechner | Oxidative Stress in Dogs With Lymphoma Before and After Administration of Doxorubicin: A Pilot Study
hunds (476 ± 42.2 m; min = 400 m; max = 556 m; 95%CI 459–498).
In conclusion, regardless of anatomical differences between Poodles and Dachshunds, they walk similar distances. Based on a previously obtained equation (Distance = 55.3 + 8.3 TC + 0.9 L + 2.1 RH), predicted distances were overestimated for Labrador and Dachshunds, demonstrating that standardization is required for different breeds.

ABSTRACT #188
EFFECTS OF TREADMILL TRAINING OVER AUTONOMIC AND HEMODYNAMIC FUNCTIONS IN HEALTHY DOGS.
JPE Pascon, D Paulino-Junior, E Zacche, FN Gava, EMG Ortiz, AA Camacho. College of Agricultural and Veterinary Sciences, Sao Paulo State University, Campus of Jabaquara, Brazil.

Regular physical activity has been widely used in human cardiovascular therapy, promoting better autonomic control, heart function, life quality and decreasing sudden death risks. In dogs, however, there is not a standardized guideline to be used. This research has the goals of evaluating the effects of standardized treadmill training over the autonomic and hemodynamic functions of healthy dogs.

Six dogs (4 Beagles; 2 mixed breed), with mean weight of 13.1 Kg, were enrolled in this study. Twenty-four hour time domain heart rate variability (HRV), and echocardiography were analyzed before and after four weeks, five days a week, 40 minutes a day training. The intensity of training was individually determined by a maximal heart rate (MHR), observed in a maximal progressive effort test. Gradually, the intensity of training was increased in 50% of MHR, in the first week, to 60%, 70% and 80% of MHR in the second, third and fourth weeks, respectively. The paired t test was used to compare data before and after training. The improvement in functional capacity of the dogs was attested by a better performance on the physical test after training, achieving higher levels of intensity (9.0 km/h to 11.1 km/h; p = 0.0155) and decreasing the area under the curve of lactate (31.2 to 26.0; p < 0.0001). Increase in parasympathetic tone on HRV was verified by SDANN (155.5 ± 50.4 to 231.7 ± 46.7 ms; p = 0.0059), rMSSD (115.3 ± 50.4 ms to 181 ± 51.9 ms; p = 0.0118), amplitude of heart rate (188.5 ± 21.9 bpm to 200.3 ± 17.5 bpm; p = 0.0033), and by a higher percentage of respiratory sinus arrhythmia on a maximal progressive effort test (> 50% to 2 km/h before training and 8 km/h after training). On the hemodynamic aspect, training lead to increase diastolic interventricular septum thickness (0.78 ± 0.12 cm to 0.91 ± 0.16 cm; p = 0.0294), decrease left atrial diameter (2.37 ± 0.22 cm to 2.15 ± 0.19 cm; p = 0.0369), left ventricular end-diastolic (4.47 ± 0.80 to 3.82 ± 0.62; p = 0.0068), and end-systolic (2.73 ± 0.39 to 1.85 ± 0.40; p = 0.0104) wall stress indexes, suggesting preload and afterload reduction. Improvement of diastolic function was confirmed by mitral E/A waves (1.42 ± 0.19 to 1.83 ± 0.46; p = 0.0467). No differences (p > 0.05) were detected on systolic function (EF%, SF%, left and right ejection time, left pre-ejection time, ejection in- dex, and mean velocity of circumferential fibers shortening), left ventricular end-systolic and end-diastolic volume indexes, and on Tei index of myocardial performance. As observed in a human being, training results in better autonomic and hemodynamic control in healthy dogs. In a near future we expect that this therapeutic modality could be helpful for cardiovascular improvement in the canine species.

ABSTRACT #187
OCCURRENCE OF HYPERTROPHIC CARDIOMYOPATHY IN A LARGE COHORT OF BRITISH SHORTHAIR CATS (BSH) FROM DENMARK.
C. A. T. H. Granström1, M. Nyberg Godskesen2, M. Christiansen3, J.L. Willelsen4, J. Koch1. 1Department of Small Animal Clinical Sciences, University of Copenhagen, Denmark. 2Department of Clinical Biochemistry and Immunology, Statens Serum Institut, Copenhagen, Denmark.

Familial hypertrophic cardiomyopathy (HCM) has previously been described in British Shorthair cats (BSH), but until now, no reports have been published on how prevalent the disease is within this breed. The aim of this study was to assess the occurrence of HCM in a large cohort of BSH and to evaluate the effect of gender, weight and age as potential risk factors to presence of the disease.

The study was conducted as a prospective study including all BSH presented at the Small Animal Hospital for HCM screening in the period of April 2006–August 2009. All cats were examined by the same two trained ultrasonographers using a Vivid 7 ultrasound system (GE Medical) with a 10 5 phased array transducer (8–10MHz). Measurements of the left ventricle were obtained by conventional 2D- and M-mode imaging of right parasternal long- and short axis views. Diagnosis of HCM was based on an overall assessment of echocardiographic findings, but cats were classified as to have a concentric hypertrophy if the interventricular septum (IVS) and/or left ventricular free wall (LVFW) measured > 5.5 mm in diastole. To rule out other causes of left ventricular concentric hypertrophy, a complete blood count, biochemical profile, thyroxin level and blood pressure were measured in affected cats. In the statistical analyses occurrence of HCM was expressed as a percentage of age, weight and echocardiographic variables and body weight and age, weight and HCM occurrence of HCM were classified as categorical variables on a scale of 0.5 (0) mm and 3.8 (± 0.5) mm. Male cats had a significantly higher occurrence of HCM (20.4%) compared with the females (2.1%)(OR of 12.7 (95% CI 4.2–38.6) for male gender (p < 0.001). No effect of weight and age on occurrence of HCM could be identified. Eighteen of the HCM positive cats had diffuse, symmetric hypertrophic changes of the entire left ventricle, whereas 5 had an asymmetric or regional hypertrophy of the left ventricular myocardium.

The conclusion of this study is that the BSH in our cohort had a high occurrence of HCM. Most affected cats presented with pronounced, diffuse hypertrophic changes affecting the IVS, LVFW and papillary muscles. As in many other breeds, male gender predisposed to development of the disease.

ABSTRACT #186
EFFECTS OF RUNNING ON THE RENIN-ANGIOTENSIN-ALDOSTERONE SYSTEM IN DOGS.
M Mizuno, M Uechi, Y Mizuno, H Hishinuma, H Shiga, M Takeuchi, N Tanaka, M Nishida, M Ito, K Kurita, K Watanabe, S Yamasue, Y Takamori, K Tanaka. College of Veterinary Medicine and Biostudies, Nihon University, Kowabe, Japan.

Exercise and stress are important factors in the development of congestive heart failure. The present study evaluates the influence of exercise upon circulatory function and the renin-angiotensin-aldosterone system (RAAS) in healthy dogs. A placebo or benazepril hydrochloride was administered to four dogs and then heart rate and blood pressure were measured every 5 minutes for 30 minutes. Plasma renin activity, angiotensin-converting enzyme (ACE), angiotensin II (Ang II), aldosterone, adrenaline, noradrenaline and urinary aldosterone were measured in the dogs before and after running on a treadmill at 7 km/h for 10 minutes. Benazepril hydrochloride significantly (P < 0.05) decreased ACE (0.9 ± 1.0 U/l) and aldosterone (21.1 ± 16.1 pg/ml) compared with the placebo (29.8 ± 15.1 U/l, 42.9 ± 29.8 pg/ml). Plasma renin activity, Ang II, aldosterone and adrenaline levels increased during exercise. Heart rate and blood pressure significantly (P < 0.05) increased with both placebo and benazepril hydrochloride during exercise, and heart rate and blood pressure did not significantly differ between the two groups. These results suggest that the increase in heart rate and blood pressure during exercise is related to activation of the RAAS and the two groups might modulate circulatory function and the RAAS during exercise.