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2017 ACVIM Forum Research Abstract Program

2017 ACVIM Forum Research Abstract Program
National Harbor, Maryland, June 8–9, 2017
Index of Abstracts

Oral Presentations – Thursday, June 8

Time	#	Presenting Author	Abstract Title
CARDIOLOGY			
4:30 PM	C01	Emily Chapel	Right Ventricular Systolic Function in Dogs with Preclinical and Clinical Myxomatous Mitral Valve Disease
4:45 PM	C02	Catherine Belanger	High-Pressure Balloon Valvuloplasty for Severe Pulmonic Stenosis: A Prospective Observational Study in 25 Dogs
5:00 PM	C03	Flavia Giacomazzi	Exit Block as a Mechanism of Sinus Node Dysfunction Evidenced by Geometric Heart Rate Variability
5:15 PM	C04	Tsumugi Kurosawa	Is the Left Atrium Prothrombotic in Cats with Aortic Thromboembolism?
5:30 PM	C05	Eva Oxford	Characterization of Gene Expression Profiles Linked to Degenerative Mitral Valve Disease in Small Breed Dogs
5:45 PM	C06	Ilaria Spalla	Prognostic Value of MAPSE and TAPSE in Feline Hypertrophic Cardiomyopathy
6:00 PM	C07	Nicole Wyatt	Echocardiographic Assessment of Aortic Root Rotation in Dogs with Congenital Heart Disease
NEUROLOGY			
9:00 AM	N01	Devin Ancona	Common Cytogenetic Alterations Define Choroid Plexus Tumors in Dogs (ACVIM Resident Research Award Eligible)
9:15 AM	N02	Devin Ancona	Pullout Properties of Monocortical and Bicortical Pins and Screws in Canine Lumbar Vertebral Bodies (ACVIM Resident Research Award Eligible)
9:30 AM	N03	Laura Barnard	Pharmacokinetic Analysis of Single Dose Extended Release Levetiracetam Per OS in Healthy Cats (ACVIM Resident Research Award Eligible)
9:45 AM	N04	Sasha Dixon	Surgical Decompression, with or without Adjunctive Therapy, for Treatment of Primary Vertebral Osteosarcoma in Dogs (ACVIM Resident Research Award Eligible)
10:30 AM	N05	Lindsey Peterson	The Effects of Stabilizing Agents, Fetal Calf Serum and Vetstarch, on Canine Cerebrospinal Fluid Analysis (ACVIM Resident Research Award Eligible)
10:45 AM	N06	Natalie Villani	GM2 Gangliosidosis in Shiba Inu Dogs with an In-Frame HEXB Deletion and Autofluorescent Storage Granules
11:00 AM	N07	Chai-Fei Li	Exosome-Associated Integrins as Liquid Biopsy Biomarkers for Canine Glioma

Fatty acid concentrations were quantified in fecal samples from 34 dogs diagnosed with EPI that were being treated with pancreatic enzyme supplements and from 82 healthy control dogs using an in-house gas chromatography/mass spectrometry (GC/MS) assay. Target analytes included palmitic acid (16:0), stearic acid (18:0), oleic acid (18:1ω9), linoleic acid (18:2ω6), α-linolenic acid (18:3ω3), gondoic acid (20:1ω9), and erucic acid (22:1ω9). A Mann-Whitney *U* test was used for comparison between groups. *P*-values were adjusted for multiple comparisons and statistical significance was set at $P < 0.05$.

Fecal FAs were significantly increased in the feces of dogs with EPI (all $P < 0.001$). Concentrations of FAs for dogs with EPI vs. healthy control dogs were (median [min-max] μg/mg of lyophilized feces): palmitic acid (12.0 [1.6–48.4] vs. 4.2 [1.3–13.4]), stearic acid (6.6 [1.1–43.2] vs. 2.3 [0.9–14.4]), oleic acid (13.8 [1.8–70.2] vs. 4.0 [0.3–16.9]), linoleic acid (10.3 [1.7–34.5] vs. 4.0 [0.4–29.7]), α-linolenic acid (1.0 [0.2–5.5] vs. 0.4 [0.1–3.5]), gondoic acid (0.69 [0.10–2.36] vs. 0.19 [0.03–0.61]), and erucic acid (0.07 [0.02–0.96] vs. 0.03 [0.01–0.27]). The sum of measured fecal FAs was 46.8 [9.0–174.6] vs. 15.3 [4.0–61.3].

Fecal fatty acid concentrations were increased in dogs with EPI, even while being treated with pancreatic enzyme supplementation. These data are consistent with malassimilation of fat in these patients.

GI09

KI-67/CD3 INDEX IN CANINE INFLAMMATORY BOWEL DISEASE. S. Karlovits[1], A. Manz[1], K. Allenspach[2], I. Walter[3], S. Kummer[3], U. Reichart[3], A. Tichy[4], B. Richter[5], A. Fuchs-Baumgartinger[5], I.A. Burgener[6], N. Luckschander-Zeller[1]. [1]Clinic for Internal Medicine, Department for Companion Animals and Horses University of Veterinary Medicine, Vienna, Austria, Vienna, Wien, Austria, [2]Iowa State University, College of Veterinary Medicine, Ames, IA, USA, [3]VetCore Facility for Research, University of Veterinary Medicine, Vienna, Austria, Vienna, Wien, Austria, [4]Department of Biomedical Sciences, University of Veterinary Medicine, Vienna, Austria;, Vienna, Wien, Austria, [5]Department for Pathobiology, Institute of Pathology and Forensic Veterinary Medicine, University of Veterinary Medicine, Vienna, Austria, Vienna, Wien, Austria, [6]Clinic for Small Animals and Infectious Diseases, VetMedUni Vienna, Austria, Vienna, Wien, Austria

Hypersensitivity and proliferation of T-cells play a key role in the pathogenesis of IBD. In human medicine, Ki-67 is an indicator for cell growth, but there are only few studies in canine medicine.

The aim of this study was to investigate Ki-67 in relation to T-cells as a marker for canine IBD.

According to clinical signs and histopathologic results eleven privately owned dogs were grouped as IBD (IBD). Six healthy beagles served as controls (CO). All dogs were clinically assessed using the Canine Chronic Enteropathy Activity Index (CCECAI) scoring system. Duodenal mucosal biopsy samples were endoscopically retrieved for histopathological examination using the World Small Animal Veterinary Association-scheme (WSAVA). Double-marked immunofluorescence microscopy was used to investigate Ki-67 for identifying proliferating cells in combination with CD3 to detect T-cells in 4 different areas (epithelium (E) and lamina propria (LP) of villi and crypts, respectively).

In IBD-patients there was a significant increase in the clinical scoring ($M = 5.2 \pm 2.7$) vs. CO (constant 0) ($P < 0.001$). Furthermore, double-positive cells were significantly increased in the LP of the crypt region of IBD-dogs ($M = 1.23 \pm 1.33$ cells/mm^2) vs. CO ($M = 0.120 \pm 0.143$ cells/mm^2) ($P = 0.022$). In this area, a significant correlation was found between CCECAI and the Ki-67/CD3 index ($r = 0.670$).

In summary, the Ki-67/CD3 index is significant upregulated in the LP, specifically in the crypt area of IBD dogs indicating a metabolically active region. In conclusion, Ki-67/CD3 could be a useful marker for canine IBD activity.

GI10

VIDEOFLUOROSCOPIC SWALLOW STUDY FEATURES OF OBSTRUCTIVE LOWER ESOPHAGEAL SPHINCTER DISORDERS IN DOGS. M. Grobman[1], J. Schachtel[1], T. Lever[2], C. Reinero[1]. [1]University of Missouri College of Veterinary Medicine, Columbia, MO, USA, [2]University of Missouri School of Medicine Department: Otolaryngology-Head and Neck Surgery, Columbia, MO, USA

In people, lower esophageal sphincter (LES) disorders causing functional obstruction have been identified as rare causes of megaesophagus (ME). Obstructive LES disorders have been identified in dogs but lack clear diagnostic criteria. Because these conditions may respond to targeted therapy, correct diagnosis is critical. Videofluoroscopic swallow study (VFSS) is the gold-standard for the diagnosis of dysphagia in dogs. Our objective was to characterize VFSS features of LES achalasia-like syndrome and dyssynchrony in dogs. We hypothesized that LES achalasia-like syndrome (LES-AS) and LES dyssynchrony (LES-D) could be distinguished from each other and normal dogs using standardized VFSS criteria.

Retrospective study. Sixty dogs presented to the University of Missouri Veterinary Health Center between April 2015-November 2016 for VFSS using a free-feeding standing protocol using at least 2 consistencies of iohexol or barium impregnated food (thin liquid, puree, and kibble). Dogs with a functional LES obstruction ($n = 11$) were further evaluated using subjective and objective metrics: presence of ME; distal esophageal bolus height relative to T12; maximal LES opening; esophageal contractility (in the face of physiologic distention), propulsions (aboral bolus movement), and primary or secondary peristalsis; "bird beak"; and timing of LES opening/closure.

Using VFSS, dogs were determined to be healthy ($n = 6$), or had LES-AS ($n = 6$), LES-D ($n = 5$), and "other" (primary esophageal dysmotility/GERD; $n = 1$). All dogs with LES-AS and 2/5 dogs with LES-D had ME, with the ratio of the esophageal bolus column height:height of T12 vertebral body being significantly greater in LES-AS compared to healthy dogs ($P = 0.021$). Dogs with LES-AS had a significantly lower ratio of distal esophageal column height:LES opening height compared to normal ($P = 0.010$) and LES-D ($P = 0.043$) dogs. Subjective contractility of the esophagus was normal ($n = 3$ LES-D), hypocontractile ($n = 2$ LES-D, $n = 1$ LES-AS) or acontractile ($n = 5$ LES-AS). Propulsions were completely effective ($n = 3$ LES-D) or ineffective ($n = 2$ LES-D). Presence of any primary and/or secondary peristaltic waves were observed in all dogs with LES-D ($n = 5$) compared to LES-AS ($n = 1$). A "bird-beak" sign was seen in all dogs with LES-AS. All dogs with LES-D had abnormal timing of LES opening and closing.

Functional obstruction of the LES due to LES-AS and LES-D represent discrete disease states distinguishable by VFSS.

GI11

EFFECT OF AN EXTRUDED VEGETABLE DIET ON FECAL MICROBIOTA OF DOGS WITH FOOD-RESPONSIVE ENTEROPATHY. F. Bresciani[1], Y. Minamoto[2], J.S. Suchodolski[2], G. Galiazzo[1], C. Vecchiato[1], C. Pinna[1], G. Biagi[1], M. Pietra[1]. [1]Department of Veterinary Medical Sciences, University of Bologna, Ozzano dell'Emilia, Emilia-Romagna, Italy, [2]Gastrointestinal laboratory, Texas A&M University, College Station, TX, USA

Intestinal dysbiosis and adverse food reactions are involved in the pathogenesis of food responsive enteropathy (FRE) in dogs. Various options for an elimination diet are available, and a vegetable dry food is one alternative. Dietary interventions are thought to alter gut microbial communities in healthy individuals and the resolution of dysbiosis is expected in diseased animals concurrent with remission of clinical signs. Therefore, the aim of this study was to evaluate changes in fecal microbiota in dogs with FRE before and after an elimination dietary trial with a vegetable diet. The same vegetable diet trial was performed in healthy control dogs (HC) to evaluate changes in fecal microbiota before and after the trial, and to compare them to FRE dogs.

Dogs with FRE ($n = 10$) and HC ($n = 14$) were fed the vegetable diet for 60 days. Fecal samples were collected before and after the dietary trial. Fecal genomic DNA was extracted and used for Illumina sequencing of 16S rRNA genes. Sequence data were analyzed using the QIIME pipeline. The dysbiosis index of the sequence data was calculated using a published mathematical model, and a score >0 was considered as dysbiotic. Statistical significance was set at $P < 0.05$.

Significantly lower alpha diversity was observed in dogs with FRE-baseline compared to HC-baseline and FRE-after trial. Distinct microbial communities were observed in dogs with FRE-baseline compared to HC-baseline (ANOSIM $P = 0.001$) and dogs with FRE-after trial (ANOSIM $P = 0.032$). Microbial communities were still different in FRE-after trial compared to HC-baseline (ANOSIM $P = 0.001$). The calculated dysbiosis index was higher in dogs with FRE-baseline compared to HC-baseline ($P = 0.022$), but no significance difference was observed between FRE-after trial and HC-baseline. The fecal microbiota in HC did not show any significant differences before vs. after the vegetable dietary trial.

Results of this study suggest that in FRE dogs, treatment with the vegetable elimination diet led to partial recovery of the fecal microbiota by significantly increasing microbiota richness, which was significantly closer to healthy microbiota after treatment. In contrast, no changes were detected in fecal microbiota of healthy control dogs fed with the same vegetable diet.

GI12
EVALUATION OF HYDROMORPHONE AND DEXMEDETOMIDINE FOR EMESIS INDUCTION IN CATS. M. Nystrom, A. Odunayo, C. Okafor. University of Tennessee, Knoxville, TN, USA

Induction of emesis after ingestion of a toxin can be challenging in cats due to the variable efficacy and adverse effects associated with the use of alpha-2 agonists as emetics. Hydromorphone may be a more effective alternative with fewer adverse effects. The objective of this study was to compare the efficacy of hydromorphone and dexmedetomidine at inducing emesis in cats.

This was a prospective, blinded, randomized crossover study utilizing 12 healthy purpose-bred cats. Cats were randomly assigned to receive hydromorphone (0.1 mg/kg [0.045 mg/lb.], subcutaneously) or dexmedetomidine (7 mcg/kg [3.2 mg/lb.], intramuscularly). Following administration, the incidence of emesis, number of emetic events, signs of nausea, temperature, heart rate, respiratory rate and sedation score were recorded.

Emesis was successful in 9 of 12 (75%) cats when treated with hydromorphone and in 7 of 12 (58%) cats when treated with dexmedetomidine ($P = 0.67$). Dexmedetomidine was more likely to cause sedation than hydromorphone ($P < 0.001$). Heart rate in cats were significantly decreased at 1 and 2 hours post-hydromorphone ($P = 0.003$, 0.014 respectively) and at 1, 2, 3, 5, 6 hours post-dexmedetomidine ($P = 0.001$, 0.003, 0.038, 0.013, 0.001 respectively). Cats were more likely to develop an increase in body temperature with hydromorphone administration.

Results of this study indicate that hydromorphone is an effective alternative to dexmedetomidine for the induction of emesis in cats. Sedation and decrease in heart rate were observed less with hydromorphone administration. Further investigation into the most adequate dose of hydromorphone for optimizing emesis is warranted.

GI13
IDENTIFICATION OF JEJUNAL LESIONS IN DOGS USING CAPSULE ENDOSCOPY. J.S. Pomrantz, J.A. Solomon. Infiniti Medical, Menlo Park, CA, USA

Imaging the jejunum in dogs is problematic. Ultrasound frequently misses mucosal lesions and traditional endoscopy does not typically reach the jejunum. ALICAM is a capsule endoscopy system that images the entire bowel. The purpose of this study was to retrospectively assess the frequency of jejunal lesions in dogs given ALICAM for gastrointestinal signs and/or laboratory abnormalities. A board-certified internist interpreted each study. Eight of 131 (6.1%) dogs had complete studies with lesions identified in the jejunum that were considered significant. Of the eight dogs with positive studies, 6 were given ALICAM for a regenerative anemia, while 2 had signs of overt gastrointestinal bleeding (melena). Five of 8 dogs had a normal gastrointestinal tract on ultrasound prior to ALICAM administration. One dog had a normal gastroduodenoscopy and a second dog had a normal gastroduodenoscopy and laparoscopy prior to ALICAM. ALICAM findings included ulcerated masses in 2/8 dogs, large erosions or ulcers in 4/8 dogs, and focal fluid, blood or mucosal abnormalities in 2/8 dogs. Following ALICAM, two dogs underwent manual push enteroscopy. In one case, the ulcerative lesions seen on ALICAM were not found. In the second case, the suspected lesion was identified and resected. A third dog had an exploratory laparotomy with subsequent identification and resection of the mass seen with ALICAM. ALICAM is useful in imaging the jejunum and should be considered an important diagnostic step in the work up of gastrointestinal disease, especially in cases of unexplained anemia where traditional endoscopy or ultrasound failed to identify a cause.

GI14
PLATELET FUNCTION AND ENDOSCOPIC CHANGES AFTER CLOPIDOGREL, ASPIRIN, PREDNISONE, OR COMBINATION THERAPY IN DOGS. J. Whittemore[1], A. Mooney[1], D. Mawby[1], J. Thomason[2]. [1]University of Tennessee, Knoxville, Knoxville, TN, USA, [2]Mississippi State University College of Veterinary Medicine, MSU, MS, USA

The purpose of this study was to determine the effects of sustained therapy with antiplatelet drugs and glucocorticoids on platelet function tests and the upper gastrointestinal tract.

Fifteen healthy dogs were randomized to 1 of 5 groups: aspirin 2 mg/kg/d (A), clopidogrel 2–3 mg/kg/d (C), prednisone 2 mg/kg/d (P) or combined prednisone with aspirin (PA) or prednisone with clopidogrel (PC) therapy PO for 28 days. Platelet count, PFA-100® analysis (collagen/epinephrine or collagen/ADP as appropriate), and endoscopy were performed at baseline, 14 days (platelet tests only), and 28 days. The presence of ≥15 hemorrhages, ≥5 punctate erosions, ≥1 invasive erosion, or ≥1 ulcer was considered clinically-significant bleeding. Dogs were categorized as antiplatelet responders if closure times were >300 sec (aspirin) or increased >30% compared to baseline (clopidogrel). Gastrointestinal bleeding and antiplatelet responder status were compared among groups by Fisher's exact test; $P < 0.05$ was considered significant.

One PA dog was removed after 14 days for severe weight loss; invasive gastric erosions were identified via capsule endoscopy. Endoscopic lesions were present at day 28 in 0/3 C dogs, 1/3 A dogs (>20 hemorrhages, 4 hemorrhagic tracts), 1/3 P dogs (≥12 invasive erosions), 2/2 remaining PA dogs (≥10 invasive erosions, each), and 2/3 PC dogs (1: 8 invasive erosions, diffuse hemorrhage; 1: 1 deep ulcer). All platelet counts were normal. There were 3/3 and 3/3 C dogs, 2/3 and 1/3 A dogs, 3/3 and 1/3 PC dogs, and 0/3 and 0/2 PA dogs classified as responders based on PFA closure times on days 14 and 28, respectively. Frequency of bleeding did not differ significantly among groups. Responder status differed significantly among groups at day 14 ($P = 0.03$) but not 28 ($P = 0.6$)

Clinically significant gastrointestinal bleeding did not occur with sustained clopidogrel therapy but occurred in all other treatment groups. Efficacy of antiplatelet therapy decreased over time, particularly in dogs receiving concurrent steroid therapy. Further evaluation in a larger population of dogs is warranted.