age-matched, phenotypically normal, carriers (controls). Arterial blood was collected from the dorsal pedal artery and analyzed immediately (VetScan i-STAT, Abaxis). Spirometry was performed using an anesthetic face-mask with rubber gasket and a calibrated pneumotachograph (model 3700, Hans Rudolph, Inc.). The signal was collected with the Ponemah Physiology Platform 4.90-SP2 (Data Sciences International). Data were compared between groups using Students t-test or Mann-Whitney rank sum test, with $P < 0.05$ considered significant. Results are reported as median ($25^{th}/75^{th}$ percentile).

Arterial blood gas data were successfully obtained from all 22 dogs. Spirometric data were successfully obtained from 21 of 22 dogs, resulting in the elimination of one pair of dogs from analysis. Compared with controls, dogs with GRMD had higher $PaCO_2$ [38.8 (35.8/41.2) mmHg; controls 35.1 (32.1/36.1) mmHg; $P = 0.014$], and bicarbonate concentrations [23.6 (21.3/23.9) mEq/L; controls, 19.9 (18.4/20.8) mEq/L; $P < 0.001$]. Dogs with GRMD also had marked elevations in peak tidal expiratory flow [PTEF; 867 (573/1086) ml/sec; controls 477 (373/691) ml/sec; $P = 0.002$], and PTEF:peak tidal inspiratory flow [2.01 (1.53/2.48); controls 1.15 (1.00/1.16); $P < 0.001$]. Differences were not detected for TV or inspiratory flow measurements.

Arterial blood gas analysis and spirometry were successfully performed without sedation, supporting the feasibility of using these techniques for serial monitoring of respiratory function in dogs with GRMD; and, a relative increase in PaCO2 was found in GRMD dogs. Increased PTEF has not been reported in people with DMD. This novel finding could be a consequence of hyperinflation, commonly seen on radiographs of dogs with GRMD, and deserves further study.

R-2

EFFECT OF OBESITY ON PULMONARY FUNCTION IN CATS WITH NATURAL BRONCHIAL DISEASE. L García-Guasch[1], A Caro-Vadillo[2], J Manubens[1], JA Montoya-Alonso[3], AA Camacho[4]. [1]HV Molins, Barcelona, Spain, [2]Med. Cir. Anim., UCM, Madrid, Spain, [3]Int. Med., ULPGC, Las Palmas, Spain, [4]UNESP - Sao Paulo - BR, Jaboticabal, Brazil.

Feline bronchial disease (FBD) is a common inflammatory disease of the lower airways. Human medicine researchers have found that obesity may play a significant role in the pathogenesis of pulmonary diseases through mechanisms that may involve proinflammatory mediators. Barometric whole-body plethysmography (BWBP) is a noninvasive pulmonary function test that allows a dynamic study of breathing patterns. The objective of this preliminary study was to evaluate if there were significant differences in tidal volume [TV] and bronchoconstriction indexes enhanced pause [Penh] and Pause [PAU] between normal weight FBD (NW-FBD) and obese FBD (O-FBD) cats by using BWBP. Forty-five client-owned cats with natural FBD were included. Cats did not have a previous history of upper airway, cardiac or systemic diseases and had negative results when tested for heartworm, FeLV and FIV diseases. Thirty-two of them were NW-FBD cats and thirteen were O-FBD cats. Obesity was defined as being 120% or more of the optimal body weight. The study was approved by the ethical committee of Veterinary Medicine Service of Las Palmas de Gran Canaria University (Spain) and it was carried out in accordance with the current European legislation on animal protection. Measured results evidenced that no significant differences were detected for any of the pulmonary function variables analyzed between NW-FBD and O-FBD cats.

TV		Penh		Pause	
NW-FBD	O-FBD	NW-FBD	O-FBD	NW-FBD	O-FBD
41,36 ± 20,09	50,40 ± 40,96	1,430 ± 1,231	1,265 ± 1,131	1,160 ± 0,509	1,064 ± 0,530
P-value = 0,659		*P*-value = 1		*P*-value = 1	

Statistically significant differences with *P*-value < 0.05

We must keep in mind some limits of this study as the high variability in bronchial involvement and to have the chance of doing bronchoreactivity tests. Although in human and canine respiratory medicine obesity is clearly associated with increased asthma severity, measured results suggest that obesity do not worse TV and bronchoconstriction indexes in natural FBD cats.

R-3

ASSESSMENT OF AIRWAY HYPERRESPONSIVENESS IN TANDEM WITH REMODELING USING PULMONARY MECHANICS AND COMPUTED TOMOGRAPHY IN EXPERIMENTAL FELINE ASTHMA. I Masseau[1], CH Chang[2], M LeFloch, JR Dodam[2], H Liu[2], CR Reinero[2]. [1]Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of Columbia, MO, [2]Comparative Internal Medicine Laboratory, College of Veterinary Medicine, University of Missouri, Columbia, MO.

Asthma is characterized by airway eosinophilia, hyperresponsiveness (AHR) and remodeling. Bronchoprovocation with methacholine (MCh) and lung biopsy remain the gold standard to assess AHR and remodeling. We hypothesized that MCh challenge during computed tomography (CT) would document AHR and remodeling in asthmatic but not healthy cats.

Healthy and experimentally asthmatic cats (n = 6/group) were anesthetized for ventilator-acquired pulmonary mechanics and CT. Baseline parameters were acquired by nebulizing saline for 30 seconds followed by four minutes of ventilator data collection. Breathholds were used to obtain inspiratory and expiratory CT scans after nebulization. Aforementioned studies were repeated using nebulized MCh (0.0625, 2 and 32 mg/ml) instead of saline. The study terminated at the dose of MCh doubling baseline resistance (EC200Raw). Lung attenuation (in Hounsfield Unit (HU)) was measured at baseline and EC200Raw using OsiriX v. 3.8.

While not significantly ($p = 0.18$) different, three asthmatics reached EC200Raw at low (<2 mg/ml) MCh doses; all healthy cats required the highest MCh dose to reach EC200Raw. There was a significant ($p = 0.008$) increase in soft tissue attenuation in the left lung field in asthmatic versus healthy cats at baseline (-826.6 ± 11.1 vs. -873.6 ± 8.6 HU, respectively) and throughout MCh nebulization. In expiration, dorsal lung field attenuation significantly increased at EC200Raw in asthmatic cats while it remained similar to baseline in healthy cats. No significant difference between the left lung volume inspiratory:expiratory ratio between groups was noted at baseline, but it significantly ($p = 0.034$) increased at EC200Raw in asthmatic compared to healthy cats.

Pilot findings suggest tandem pulmonary mechanics and CT imaging may detect AHR and remodeling in asthmatic cats.

R-4

SHORT TERM USE OF MESENCHYMAL STEM CELLS FAILS TO MODULATE BGA-SPECIFIC AIRFLOW LIMITATION IN EXPERIMENTAL FELINE ASTHMA. JE Trzil[1], CH Chang[1], T Webb[2], JR Dodam[1], LA Cohn[1], H Liu[1], S Dow[2], CR Reinero[1]. [1]Comparative Internal Medicine Laboratory, College of Veterinary Medicine, University of Missouri, Columbia, MO, [2]Center for Immune and Regenerative Medicine, Colorado State University, Fort Collins, CO.

Pilot data suggested adipose-derived mesenchymal stem cells (aMSCs) diminished some aspects of the immune response in experimental feline asthma. We hypothesized that aMSCs would improve Bermuda grass allergen (BGA)-induced airflow limitation.

Nine "high-responder" cats (severe responses to BGA challenge) were selected from 24 cats with experimental asthma. Five cats received six i.v. infusions of aMSCs (range: 0.42–2.5X10E7 aMSCs/infusion) every two weeks; four cats received placebo. Ventilator-acquired pulmonary mechanics were performed at baseline, day 3 and week 6 using BGA bronchoprovocation (1.25-40 ug/ml); the endpoint was the BGA concentration increasing baseline airway resistance by 150% (EC150Raw). A Visual Assessment Score (VAS; 0-10 cm with 10 being severe), a visual analog scale used to grade severity of clinical signs after allergen challenge, was performed on days 0, 2, 38, 72, and 110. Data were analyzed using a two-way ANOVA with $p < 0.05$ considered significant.