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Relationship of emphysema and airway disease assessed by CT to exercise capacity in COPD.

Diaz AA, Bartholmai B, San Jos   Est  par R, Ross J, Matsuoka S, Yamashiro T, Hatabu H, Reilly JJ, Silverman EK, Washko GR.: Respiratory medicine, 2010 104(8):1145-51. Pulmonary and Critical Care Medicine Division, Brigham and Women's Hospital, Harvard Medical School, 75 Francis Street, Boston MA, USA. adiaz6@partners.org

OBJECTIVE: To assess the association of emphysema and airway disease assessed by volumetric computed tomography (CT) with exercise capacity in subjects with chronic obstructive pulmonary disease (COPD). **METHODS:** We studied 93 subjects with COPD (Forced Expiratory Volume in 1 s [FEV(1)] %predicted mean +/- SD 57.1 +/- 24.3%, female gender = 40) enrolled in the Lung Tissue Research Consortium. Emphysema was defined as percentage of low attenuation areas less than a threshold of -950 Hounsfield units (%LAA-950) on CT scan. The wall area percentage (WA%) of the 3rd to 6th generations of the apical bronchus of right upper lobe (RB1) were analyzed. The 6-min walk distance (6MWD) test was used as a measure of exercise capacity. **RESULTS:** The 6MWD was inversely associated with %LAA-950 ($r = -0.53$, p

Changes in Exhaled Nitric Oxide Related to Estrogen and Progesterone During the Menstrual Cycle.

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Background: Significant changes in asthma and atopy occur through the menstrual cycle. We hypothesized that characteristics of asthma (symptoms, exhaled nitric oxide [eNO] as a marker of airway inflammation, pulmonary function and atopy) vary through the menstrual cycle in relation to changes in estrogen or progesterone, and that this variation is attenuated in women using oral contraception (OC).

Methods: Seventeen women with asthma were studied over their menstrual cycle with daily measurements of symptoms, eNO, spirometry, 17 β -estradiol and progesterone, and alternate day allergy skin prick tests (SPT). Of 534 potential daily visits, 526 (98.5%) were completed.

Results:

Individuals not using OC (n = 8) had higher mean eNO levels (48.2ppb, 95%CI: 43.1, 53.3) than women using OC (27.0ppb, 95%CI: 24.2, 29.7; $p \leq 0.005$). Among women not using OC, a 10 pmol/L increase in 17 β -estradiol levels was associated with a 15.2 ppm decrease in eNO level (95%CI -23.4, -7.0; p

Conclusion:

During natural menstrual cycles, increases in estrogen levels were associated with decreased eNO levels while increases in progesterone levels were associated with increased eNO levels and SPT wheal size. These effects were not observed among women using oral contraception.

Effect of adjunct fluticasone propionate on airway physiology during rest and exercise in COPD. Guenette JA, Raghavan N, Harris-McAllister V, Preston ME, Webb KA, O'Donnell DE.

105(12):1836-45, 2012 **RATIONALE:** Combination therapy with corticosteroid and long-acting $\beta(2)$ -agonists (LABA) in a single inhaler is associated with superior effects on airway function and exercise performance in COPD compared with LABA monotherapy. The physiological effects of adding inhaled corticosteroid monotherapy to maintenance bronchodilator therapy (long-acting anticholinergics and LABA singly or in combination) in COPD are unknown.

METHODS: This was a randomized, double-blind, placebo-controlled, crossover study (NCT00387036) to compare the effects of inhaled fluticasone propionate 500 μ g (FP500) twice-daily and placebo (PLA) on airway function during rest and exercise, measured during constant work rate cycle exercise at 75% of maximum incremental cycle work rate, in 17 patients with COPD (FEV(1) = 70% predicted).

RESULTS: After treatment with FP500 compared to PLA, there were significant increases in post-dose measurements of FEV(1) (+115 mL, $P = 0.006$) and the FEV(1)/FVC ratio (+2.5%, $P = 0.017$), along with decreases in plethysmographic residual volume (-0.32L; $P = 0.031$), functional residual capacity (-0.30L, $P = 0.033$), and total lung capacity (-0.30L, $P = 0.027$) but no changes in vital capacity or inspiratory capacity (IC). Post-treatment comparisons demonstrated a significant improvement in endurance time by 188 ± 362 s with FP500 ($P = 0.047$) with no concomitant increase in dyspnea intensity. End-inspiratory and end-expiratory lung volumes were reduced at rest and throughout exercise with FP500 compared with PLA ($P = 0.001$ and $P = 0.002$ respectively). Total walking time (TWT) was computed.

RESULTS: Times spent WLK ($P=0.031$), FWLK ($P=0.001$), TWT ($P=0.021$), and steps per day ($P=0.013$) differed significantly between GOLD stages. There was a significant negative correlation between TWK and GOLD stage ($R=-0.35$; $P = 0.001$).