

European Respiratory Society Annual Congress 2012

Abstract Number: 1117

Publication Number: P4437

Abstract Group: 4.1. Clinical physiology and Exercise

Keyword 1: Exercise **Keyword 2:** Embolism **Keyword 3:** Pulmonary hypertension

Title: Portioning out the contribution of dead space ventilation and low CO₂ set point to ventilatory inefficiency during exercise in chronic thromboembolic pulmonary hypertension

Dr. Roberta Pulcheri 7803 Ramos robertapulcheri@gmail.com MD ¹, Dr. Jaquelina Sonoe Ota 7804 Arakaki jaqueota@gmail.com MD ¹, Dr. Eloara Vieira Machado 7805 Ferreira eloaravmf@yahoo.com.br MD ¹, Mr. Adriano 7806 Acedo adrianoacedo@hotmail.com ¹, Ms. Melline 7807 Almeida mell_almeida@yahoo.com.br ¹, Prof. Dr Luiz Eduardo 7808 Nery lenery@uol.com.br MD ¹ and Prof. Dr J. Alberto 7809 Neder nederalb@gmail.com MD ¹. ¹ Pulmonary Function and Clinical Exercise Physiology Unit (SEFICE), Respiratory Division, Department of Medicine; Federal University of São Paulo – Paulista School of Medicine (UNIFESP-EPM), Sao Paulo, SP, Brazil, 04020-050 .

Body: Rationale: The individual relevance of enlarged dead space ventilation as a fraction of tidal volume (VD/VT) and low CO₂ set-point in promoting exercise ventilatory inefficiency in chronic thromboembolic pulmonary hypertension (CTEPH) remains controversial. Objective: To determine the contributing role of VD/VT and PaCO₂ on the excessive ventilatory response to exercise in patients with CTEPH. Material and methods: 20 patients (47 ± 14 yrs, mean pulmonary artery pressure= 52 ± 10 mmHg) underwent an incremental exercise test and a steady-state test with arterial blood gases measurements. Results: Compared to normal standards, patients showed lower resting PaCO₂ and peak V'O₂ but greater ΔV'E/ΔV'CO₂ slope (68 ± 16). Peak V'O₂ and ΔV'E/ΔV'CO₂ were inversely correlated (r= -0.70; p<0.05). V'E/V'CO₂ ratio during the constant work rate test was also abnormally high (62 ± 15). VD/VT increased from 0.31±0.08 at rest to 0.39±0.11 during exercise; on the other hand, end-tidal partial pressure (PET) for CO₂ decreased despite a stable PaCO₂ (p>0.05). Consequently, P(a-ET)CO₂ became wider (4 ± 3 mmHg to 8 ± 5 mmHg), a finding related to greater V'E/V'CO₂ (r= 0.81; p<0.05). On a multiple regression analysis VD/VT (partial r = 0.89) and PaCO₂ (partial r = -0.37) explained up to 90% of V'E/V'CO₂ variability (125.9 VD/VT - 2.3 PaCO₂ + 77.1; p<0.001). Conclusion: Increased VD/VT is the main pathophysiological mechanism leading to an excessive ventilatory response to exercise in patients with CTEPH. Low CO₂ set-point responds for a relatively minor portion of this abnormal feature.