Abstract Group: 8.1. Thoracic Surgery

Keyword 1: COPD - management  Keyword 2: Lung growth/development  Keyword 3: Lung mechanics

Title: Study of compensatory lung growth after right bilobectomy in a COPD experimental model

Ms. Francine 26672 Almeida francinealmeida@usp.br ¹, Dr. Beatriz 26673 Saraiva-Romanholo francinealmeida@usp.br ¹, Dr. Rodolfo 26674 Vieira rodrelena@yahoo.com.br ², Dr. Henrique 26675 Moriya htmoriya@leb.usp.br ³, Dr. Fernanda 26676 Lopes fernanda@experimental.fm.usp.br ¹, Prof. Dr Thais 26690 Mauad tmauad@usp.br MD ⁴, Prof. Dr Milton 26711 Martins francinealmeida@usp.br MD ¹ and Dr. Rogerio 26714 Pazetti rogeriopazetti@yahoo.com.br ⁵. ¹ Laboratory of Experimental Thepeutics, São Paulo University Medical School, São Paulo, SP, Brazil, 01246-000 ; ² Post Graduate Program in Biophotonics Applied to Health Sciences, Nove de Julho University, São Paulo, SP, Brazil ; ³ Telecommunications and Control (LEB), São Paulo University Polytechnic Institute, São Paulo, SP, Brazil ; ⁴ Pathology, São Paulo University Medical School, São Paulo, SP, Brazil, 01246-000 and ⁵ Laboratory of Thoracic Surgery Research-LIM61, Heart Institute (InCor), Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo, SP, Brazil, 01246-000.

Body: Lung volume reduction surgery (LVRS) is one of the surgical approaches performed in COPD patients waiting for lung transplant. We hypothesized that compensatory lung growth (CLG) after LVRS is important to explain the improvement of life quality in these patients after LVRS. We investigated the CLG physiological effects after right bilobectomy (LBX) in a COPD rodent model. Sixty-four rats were assigned in 4 groups: saline+sham LBX (SS), saline+LBX (SO); elastase+sham LBX (ES); and elastase+LBX (EO). Forty days after instillation with elastase (5UI/100g) or saline, animals were underwent to sham surgery or right LBX (middle and cardiac lobes). Eight animals from each group were killed after 2 (T1) or 4 (T2) weeks and ventilatory parameters, lung tissue remodeling, gas exchange area and inflammatory cells were measured. All elastase-treated animals showed a typical destruction of lung parenchyma architecture with a decrease in elastic fibers amount (11.1±4.1 and 9.4±2.7%, saline and elastase, respectively, p<0.05) and an increase in average alveolar diameter (Lm) (66.5±6.1 and 94.3±18.6µm, saline and elastase, respectively, p<0.05) and collagen fibers proportion (8.6±1.6 and 11.7±1.4%, saline and elastase, respectively, p<0.05). The CLG observed in elastase-treated animals after LBX was followed by a decrease in Lm (94.1±13.9 and 76.8±10.9µm, ES and EO, respectively, p<0.05), and an increase in lung elastance (1.2±0.1 and 1.6±0.3cmH₂O/mL/s, ES and EO, respectively, p<0.05) and elastic fibers (8.5±1.1 and 13.1±1.1%, ES and EO, respectively, p<0.05). We conclude that the compensatory lung growth after LBX plays an important role in the improvement of lung elasticity and function in COPD animals.