

# European Respiratory Society Annual Congress 2013

**Abstract Number:** 4698

**Publication Number:** P4274

**Abstract Group:** 6.3. Tobacco, Smoking Control and Health Education

**Keyword 1:** COPD - mechanism **Keyword 2:** Treatments **Keyword 3:** Animal models

**Title:** Effect of low level laser (LLL) and mesenchymal stem cells (htMSCs) therapies on cigarette-induced lung inflammation in mice

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**Body:** Chronic Obstructive Pulmonary Disease (COPD) has a high prevalence and economic and social cost. In this context, new therapeutic approaches such as the use of Mesenchymal Stem Cells (MSCs) or low level laser therapy (LLL) may be innovative and promising. Here we investigated the effect of LLL (670 nm) and htMSCs (human tubal-derived Mesenchymal Stem Cells) for the treatment of cigarette-induced pulmonary inflammation in mice. To induce COPD C57Bl/6 mice were submitted to cigarette smoke for 75 days (2 times/day). Next, animals were treated with LLL (COPD+LLL group) or htMSCs (COPD+htMSCs group) 7 and 15 days before the experiment, on day 76th when mice were sacrificed for morphologic and functional analysis of the lung. Bronchoalveolar lavage (BAL) analysis showed that COPD+LLL and COPD+htMSCs groups had a significant decrease in neutrophils and lymphocytes when compared to COPD group. This was associated with reduced mucous secretion and collagen deposition. Moreover, LLL significantly reduced IL-6 and TNF- $\alpha$ , which was not observed after htMSCs. In vitro experiments showed reduction in IL-6 secretion by bronchial epithelial cells (BEC) and TNF- $\alpha$  by pneumocytes type II (PII) exposed to cigarette extract at 2,5% and further irradiated with LLL. These results indicate that LLL and htMSCs therapies have anti-inflammatory effect on cigarette-induced lung inflammation reducing local inflammation and may be considered interesting therapeutic approaches. Support Financial: UNINOVE, FAPESP-CEPID, INCT,CNPq.