Inhaled iloprost in the treatment of COPD

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Background: Alterations in the pulmonary vasculature occur early in chronic obstructive pulmonary disease (COPD), but it is unknown if treatments directed at the vasculature are beneficial.

Methods: After a COPD-like model was induced using LPS/elastase, mice were treated with intransal iloprost or placebo and measurements of airway hyperresponsiveness (AHR), serum and bronchoalveolar lavage fluid (BALF) cytokines and oxidative stress, and smooth muscle actin (SMA) were made. In an ongoing human study, COPD patients are treated with one dose of inhaled iloprost and placebo in a randomized, double-blind crossover fashion. Thirty minutes after drug, patients undergo a maximal cardiopulmonary exercise test and dynamic hyperinflation (DH), peak oxygen consumption (VO_2peak), and alveolar deadspace are measured.

Results: In the mouse study, six week treatment with iloprost significantly improved AHR and reduced BALF neutrophils, serum IL-1-beta, IL-2, IL-10, and nitrite. SMA in the lung homogenate was significantly reduced after iloprost treatment, and SMA thickness was reduced in the small/medium blood vessels. To date, we have data on 8 of the COPD patients and found that DH was significantly lower after iloprost compared to placebo. Additionally, VO_2peak and alveolar deadspace were improved after iloprost.

Conclusions: Intransal iloprost led to improvements in AHR, cytokines, and oxidative stress in a COPD model. If inhaled iloprost is found to be beneficial after completion of the human study, a longer-term trial would be needed to confirm its clinical utility.

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