

Additive effect of targeted lung denervation plus drug in patients with COPD

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Background: Disrupting parasympathetic signaling to the lungs is a well-validated treatment target for COPD patients. Anticholinergic drugs block acetylcholine binding to muscarinic receptors. Targeted lung denervation (TLD) is a novel bronchoscopic therapy that ablates the parasympathetic pulmonary nerves along the main bronchi. Simultaneous disruption of both these mechanisms may have a synergistic effect.

Aim: Evaluate combined impact of TLD plus ipratropium on COPD patients.

Methods: A first-in-human, prospective multicenter study in COPD patients ($FEV_1/FVC < 0.70$; FEV_1 30-60% predicted; >15% reversible to ipratropium) was conducted (NCT01483534). Baseline spirometry was performed off all bronchodilators and repeated on ipratropium (80 mcg). TLD was then performed using a lung denervation system (Holaira, Inc., USA) at either 15W or 20W energy doses. Spirometry was repeated on ipratropium at 90, 180 and 365 days.

Results: Twenty-two patients were treated in a staged fashion, 12 (FEV_1 33.8±9.4 % predicted, 58.3% male, age 62.9±11.4 yrs) at a 20W energy dose and 10 (FEV_1 34.5±6.3 % predicted, 40% male, age 64.4±8.9 yrs) at 15W. Change from baseline FEV_1 off bronchodilators are shown as mean±SEM in the Figure. TLD has an additive effect to ipratropium in the 20W group ($p=0.047$ at 365 days).

Conclusion: TLD potentially provides additive bronchodilation. A large-scale randomized study is underway to evaluate this further.

