Bilateral targeted lung denervation in patients with COPD in a single procedure

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Background: Acetylcholine derived from parasympathetic nerves is a well-validated pharmacologic target to treat patients with COPD. Unfortunately, long-term compliance with inhaled bronchodilators is poor. Targeted lung denervation (TLD) is a novel bronchoscopic therapy for COPD that ablates parasympathetic pulmonary nerves along the main bronchi.

Aim: Demonstrate feasibility and safety of treating both lungs in a single TLD procedure.

Methods: A prospective, multicenter, study of patients with COPD (FEV_1/FVC<0.70; FEV_1 30-60% predicted; >15% reversible to ipratropium) was performed evaluating safety and feasibility of TLD (NCT01716598) using a lung denervation system (Holaira, Inc., USA). Patients underwent bilateral TLD in a single procedure following baseline assessment off and on tiotropium and repeat assessment at 30 and 90 days after TLD.

Results: Fifteen patients (47% male, age 63.2±4.0 yrs) underwent TLD at 15 watts. TLD was technically successful 100% of the time. Procedure time was 46±11 minutes per lung. At baseline off tiotropium, FEV_1 and 6MWT distance were 0.77±0.24 liters (l) & 354±139 meters (m) respectively; at baseline on tiotriopium 1.09±0.22 l & 406±111 m; 30 days following TLD off tiotropium 1.09±0.32 l & 369±126 m; and 90-days 1.02±0.32 liters & 409±108 m. There were no procedural complications. Six respiratory adverse events, 1 serious adverse event (tachycardia at 85 days, now stable) and no hospitalizations occurred within 90 days of TLD.

Conclusion: TLD delivered to both lungs in a single procedure is feasible and safe with few 90-day respiratory related adverse events. TLD improves FEV_1 and 6MWT distance similarly to inhaled long-acting muscarinic antagonists.