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Oscillation Lung Expansion Therapy (OLE) with The MetaNeb® System in the Emergency Department Is Associated with Decreased Hospitalizations for COPD and Asthma patients[1]

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RATIONALE

Hospital admission of patients with reactive airway diseases like asthma, COPD, and bronchiectasis, are a significant burden on the healthcare system. The goal of this study was to determine whether incorporation of oscillation lung expansion (OLE) therapy with The MetaNeb® System provides more effective respiratory treatment than nebulization with a standard small volume nebulizer.

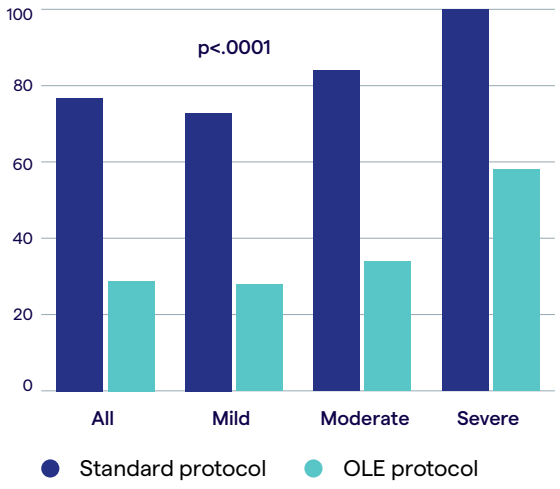
METHODS

A retrospective pre-post cohort study was conducted using electronic medical records data. The population of interest was patients with ICD 9/10 codes for COPD, asthma, bronchiectasis who presented to the emergency department (ED) at the Oklahoma University Medical Center, with reactive airway disease, requiring bronchodilator nebulization. The study period was 36 months between December 1, 2016 and November 30, 2019. In the first 18 months, patients were treated with our standard Reactive Airway Protocol (RAP), which included administering bronchodilator therapy using a small volume nebulizer for a 10-minute therapy. In the subsequent 18 months, the RAP was revised and OLE therapy was added using The MetaNeb® System in the CHFO mode. This oscillating pressure therapy with the bronchodilator was delivered for 10 minutes. Admission rates were measured during the 18-months of standard nebulizer use alone and compared to the 18 months of OLE therapy with the nebulized bronchodilator. Comparisons were conducted using the Fisher Chi Square test for categorical variables.

Treatment Protocol

0	1: Mild	2: Moderate	3: Mod-Severe	4: Severe
0 points No treatment needed: Notify physician	1-6 points 60mg prednisone X1 (If not given prior to Tx) 5mg Albuterol/ 0.5mg Atrovent X1 PEF after Tx Reassess Pt 20 min after Tx. If indicated, administer 5mg Albuterol X1	5-8 points 60mg prednisone X1 (If not given prior to Tx) 5mg Albuterol/ 0.5mg Atrovent X1 Repeat w/5mg Albuterol Maximum 3 Tx's in the 1st hr. PEF after each Tx	8-11 points 60mg prednisone X1 (If not given prior to Tx) 5mg Albuterol/ 0.5mg Atrovent Every 20 min PEF after Tx	11+ points 5mg Albuterol/ 0.5mg Atrovent X1 If no improvement 15mg Albuterol cont. neb. Monitor every 15 min W/minimal improvement 5mg Albuterol/ 0.5mg Atrovent reassess after each Tx: PEF greater than 70%

Hospitalization rate by disease severity



65%[1] **reduction in hospitalizations with patients receiving OLE therapy compared with standard RAP period.**

$4.4M[2,3] **IN COST SAVINGS**

RESULTS

The study population included 1,662 subjects who met criteria. 444 patients treated with the standard protocol and 1218 were treated with OLE. The mean age was 54.7(15.3) and 58% were female. The primary diagnosis in 67% of the subjects was COPD and 33% had Asthma. A significantly higher proportion of patients treated during the standard RAP period (79% - 351/444) were admitted to the hospital compared to the revised RAP period, during which patients received OLE (28% - 353/1218) (P<.0001). This represents a 64.56% reduction in rate of hospitalizations.

CLINICAL IMPLICATIONS

Utilization of OLE therapy to treat patients with reactive airways in the ED was associated with significantly improved patient outcomes and reduced hospital admission rates.

ECONOMIC IMPLICATIONS

Implementation of the OLE ED program resulted in avoidance of 609 hospitalizations. This translates to $4.4 million in cost savings over 18 months.[2,3]

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1 Chasteen B., Wanjala M., et al. Oscillation Lung Expansion Therapy (OLE) with The MetaNeb® System Is Associated with Decreased Hospitalizations for Acute Reactive Airway Disease Exacerbations Compared to Standard Small Volume Nebulizers, ATS 2021, A 2265.

2 Dalal AA, Shah M, D'Souza AO, Rane P. Costs of COPD exacerbations in the emergency department and inpatient setting. Respir Med. 2011;105(3):454-460. doi:10.1016/j.rmed.2010.09.003

3 Hillrom Data on file