Background

NIV is frequently employed in the management of exacerbations of chronic lung disease; however, there is a lack of in vivo data on pulmonary deposition of aerosolized medicines with different types of nebulizers during this form of respiratory support.

Objective

The aim of this study was to compare lung deposition of a radio-labeled aerosol delivered using a vibrating mesh nebulizer versus a jet nebulizer during NIV.

Materials and Methods

Design: Randomized crossover study

Healthy male and female subjects aged 18–60 years with an FVC or FEV₁ ≥80% predicted

N=10

- Subjects inhaled ⁹⁹ᵐTc-DTPA (25 mCi/3 mL) combined with salbutamol 2.5 mg, ipratropium bromide 0.25 mg, and 0.9% saline solution
- Nebulizers were operated until 1 minute following the onset of sputter or until no visible aerosol was produced (whichever came first)
- Pulmonary aerosol deposition was evaluated using scintigraphic imaging
Pulmonary Deposition of Radio-labeled Aerosol Using a Vibrating Mesh Nebulizer versus a Jet Nebulizer During Non-invasive Ventilation

Original article: Galindo-Filho VC, Ramos ME, Rattes CSF, et al. Radioaerosol pulmonary deposition using mesh and jet nebulizers during noninvasive ventilation in healthy subjects. Respir Care. 2015;60(9):1238-1246.

Aerosol delivery to the lungs during NIV was significantly greater with a vibrating mesh nebulizer versus a jet nebulizer

Radio-labeled aerosol deposited in the lungs (% of nominal dose)

<table>
<thead>
<tr>
<th>Drug delivery system</th>
<th>% of nominal dose</th>
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<tbody>
<tr>
<td>Jet nebulizer</td>
<td>1.5%</td>
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<tr>
<td>Vibrating mesh nebulizer</td>
<td>5.5%</td>
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</tbody>
</table>

Representative scintigraphic images of pulmonary aerosol deposition

Radio-labeled drug delivered into the respiratory tract during NIV was 3-4 times higher with a vibrating mesh nebulizer versus a jet nebulizer

NIV, non-invasive ventilation; NIVO, vibrating mesh nebulizer (NIVO, Philips Respironics).