

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.

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

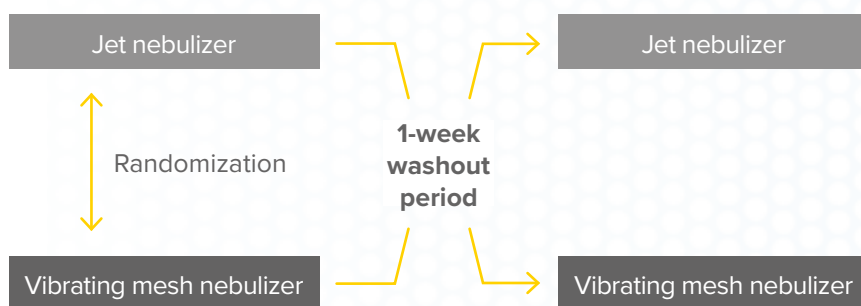
Objective



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

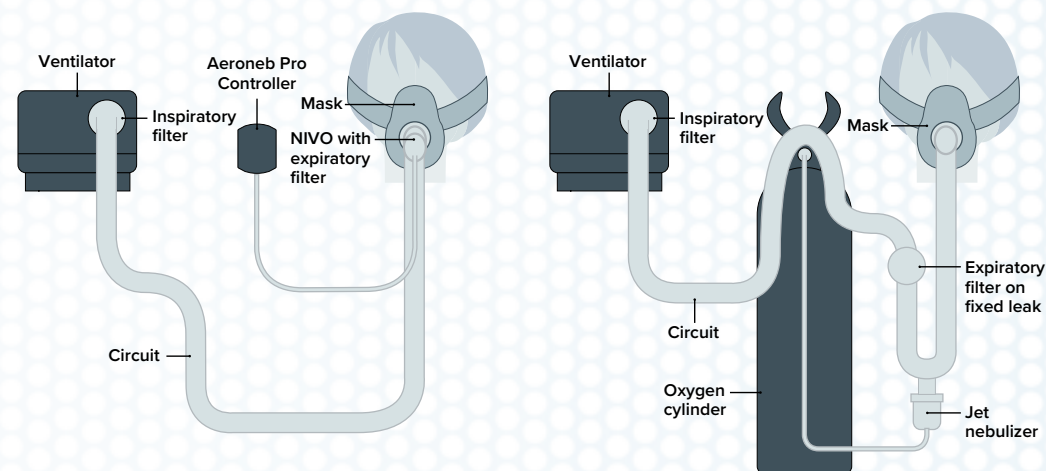
Design: Randomized crossover study



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

N=10

Aerosol delivery and deposition analysis



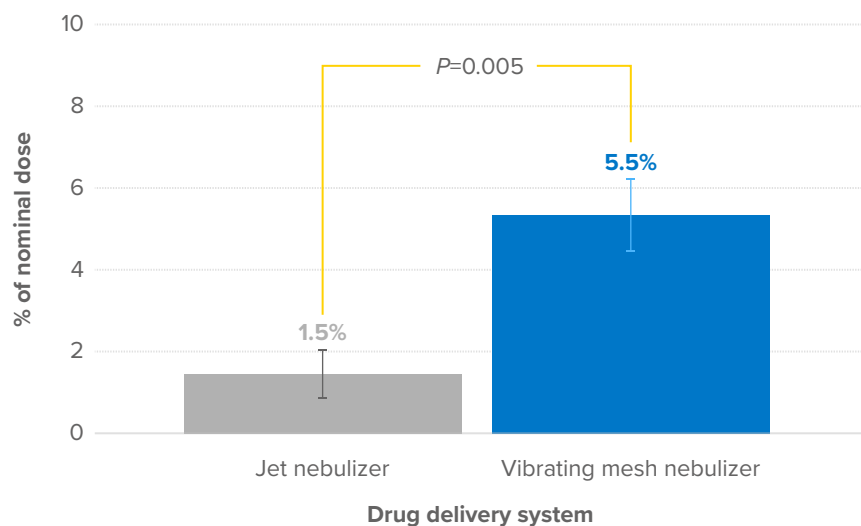
- Subjects inhaled ^{99m}Tc-DTPA (25 mCi/3 mL) combined with salbutamol 2.5 mg, ipratropium bromide 0.25 mg, and 0.9% saline solution
- Nebulizers were operated until 1 minute following the onset of sputter or until no visible aerosol was produced (whichever came first)
- Pulmonary aerosol deposition was evaluated using scintigraphic imaging

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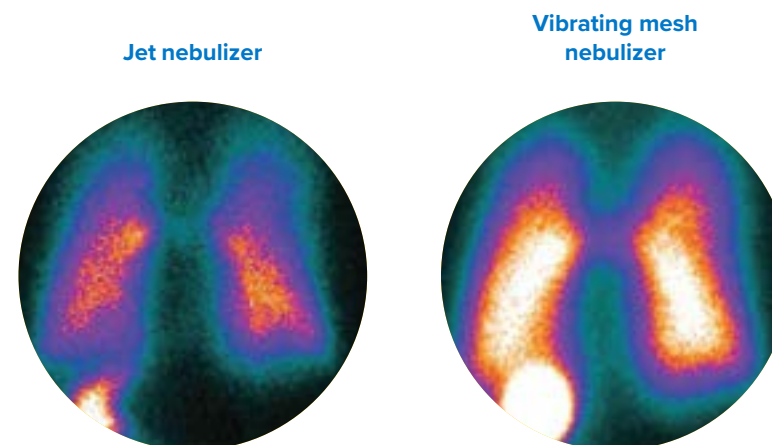
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Aerosol delivery to the lungs during NIV was significantly greater with a vibrating mesh nebulizer versus a jet nebulizer

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



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

