

Pulmonary Deposition of Radio-labeled Aerosol Using the Aerogen® Ultra Versus a Conventional Jet Nebulizer In Healthy Volunteers

Original article: Dugernier J, Hesse M, Vanbever R, et al. SPECT-CT comparison of lung deposition using a system combining a vibrating-mesh nebulizer with a valved holding chamber and a conventional jet nebulizer: a randomized cross-over study. Pharm Res. 2017;34(2):290-300.

Background



The Aerogen Ultra is a novel drug delivery system that combines vibrating mesh technology with a valved holding chamber. It was designed to optimize delivery of aerosolized medicines to the lungs in spontaneously breathing patients

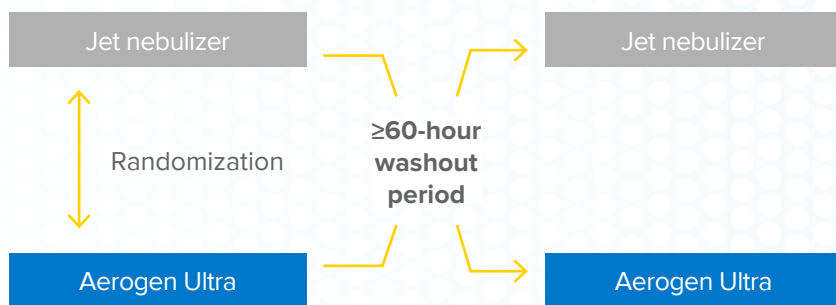
Objective



The aim of this study was to compare lung deposition of radio-labeled aerosol delivered using the Aerogen Ultra versus a constant-output jet nebulizer in healthy subjects

Materials and Methods

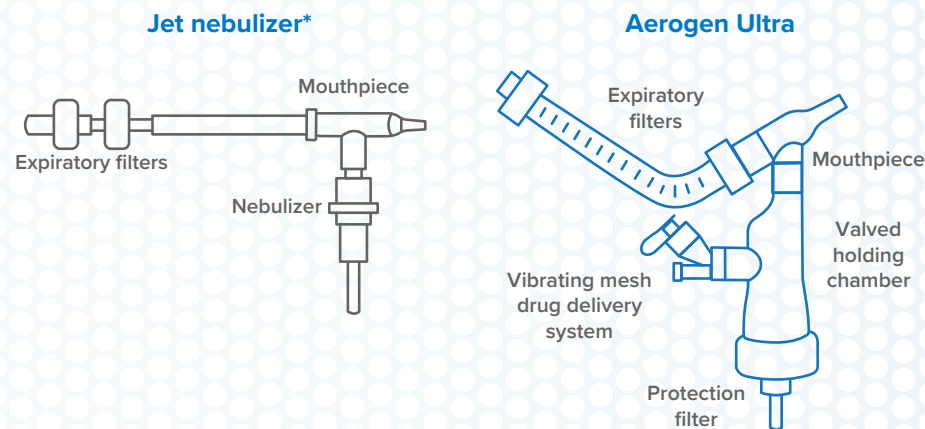
Design: Randomized, single-blind crossover study



Healthy non-smoking male volunteers aged ≥18 years with normal lung function

N=6

Aerosol delivery and deposition analysis



- Subjects inhaled radio tagged aerosol until the onset of sputtering (jet nebulizer) or no visible evidence of nebulization (Aerogen Ultra)
- Pulmonary aerosol deposition was evaluated using SPECT-CT and planar imaging

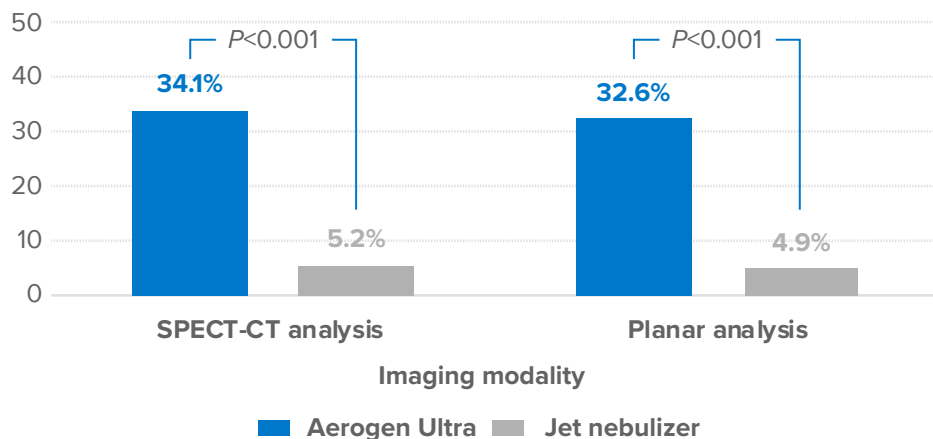
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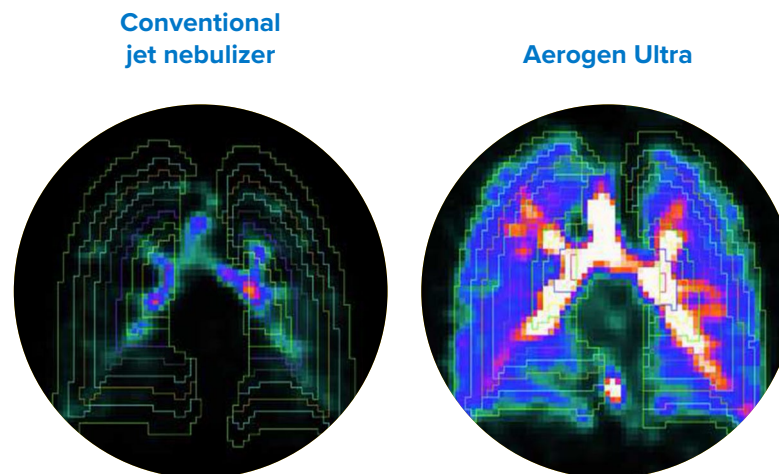


Aerosol delivery to the lungs is more than six times higher with the Aerogen Ultra versus a conventional jet nebulizer

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



Representative SPECT-CT images of pulmonary aerosol deposition



	Aerogen Ultra	Jet nebulizer	P-value
Mean (SD) drug output rate	5.1 (0.3) μ Ci/min	0.9 (0.2) μ Ci/min	<0.001
Nominal dose emitted	97.8%	37.5%	<0.05

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