



Inhalation therapy in mechanical ventilation

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Devices that produce aerosol particles of $< 2 \mu\text{m}$ in mass median aerodynamic diameter are more efficient during mechanical ventilation than are those that produce larger particles. Other factors influencing aerosol drug delivery to mechanically ventilated patients include the aerosol-generating device, the condition of the ventilator circuit, the artificial airway, and the ventilator settings. Next-generation nebulizers known as vibrating membrane nebulizers or vibrating mesh nebulizers have recently been developed, their aerosol delivery efficiency having been estimated to be twice to three times as high as that of jet nebulizers.

Ari et al.⁽¹⁾ conducted an experimental study comparing jet nebulizers and vibrating membrane nebulizers in terms of their efficacy in simulated pediatric and adult lung models during mechanical ventilation. The authors found that drug (albuterol sulfate) delivery was 2- to

4-fold greater with a vibrating mesh nebulizer than with a jet nebulizer ($p = 0.001$). It is of note that active humidification was used in that study.

Given the wide range of variables that can influence inhaled drug delivery to patients on mechanical ventilation, we read with great interest the review article by Maccari et al.⁽²⁾ However, we found it surprising that the authors did not include vibrating membrane nebulizers among the nebulizers for use in mechanically ventilated patients. In addition, Figure 1 in the aforementioned study⁽²⁾ shows a heat and moisture exchanger. The authors reported that the use of humidifying devices reduces aerosol deposition and the number of deposited particles by as much as 40%. An update of the American Association for Respiratory Care guidelines recommends that filtered heat and moisture exchangers be removed during nebulization.⁽³⁾ This can be confusing and misleading to the reader.

REFERENCES

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