



Letters to the Editor

Intensive care unit mishap during nebulization

Sir,

We read the case report by Raut *et al.*^[1] with great interest, but we wish to make certain comments on routine saline nebulization used for humidification of tracheostomy and that lead to this interesting case report.

Aerosol water particles that range in size from 1 to 10 μm may deposit on the airway by impaction (large particles) or sedimentation (smaller particles). Sedimentation occurs as a gravitational effect when airflow velocity declines in the smaller airways. An aerosol cannot contribute to respiratory gas conditioning downstream the isothermic saturation boundary because the gas is already fully saturated. For this same reason, aerosol water particles cannot be eliminated in this airway region through evaporation and exhalation. They will, therefore, become a water burden on the mucosa that needs to be absorbed by the airway epithelium. Furthermore, if the aerosol deposition rate exceeds absorption capacity, this may lead to increased airway resistance and possibly narrowing or occlusion of small airways. Severe systemic overhydration subsequent to ultrasound aerosol therapy has been described in a term newborn infant, and similar occurrences were reported in adults.^[2]

If an aerosol stream meets the airway proximal to the isothermic saturation boundary, the particulate water can theoretically contribute to the gas conditioning process by evaporation before and after deposition. The droplets, however, contain sensible heat only, and the mucosa needs to supply most of the latent heat for vaporization. This will cool the airway.

Water or normal saline nebulization, therefore, appears to offer no significant benefit for inspiratory

gas conditioning and may entail a risk of over-humidification.^[2,3]

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Conflicts of interest

There are no conflicts of interest.

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