Endotracheal Tube Cleaning With a Novel Mechanism for Secretion Removal

The need for invasive mechanical ventilation in the ICU results in a search for devices and/or techniques to allow better cleaning of these airways, especially for patients with hypersecretion. It is believed that the common method of tracheal suctioning may have some limitations in the clearance of secretions in the endotracheal tube. The traditional suction catheter may not be able to sweep the entire area of the endotracheal tube, leaving secretions in the lumen, allowing the possibility of colonization by microorganisms.¹

Secretions trapped in the endotracheal tube may reduce its internal diameter from as little as 10–15% to its total occlusion. This causes an increase in resistance to air flow,² work of breathing, patient-ventilator asynchrony, mechanical ventilation duration, and stay in the ICU.³ The American Association for Respiratory Care suggests that the endotracheal suction catheter should occupy <50% of the lumen of the endotracheal tube in children and adults.⁴ The guidelines also suggest that the vacuum should be set at the lowest level for the aspiration procedure.⁴

The study by Pinciroli et al⁵ is very interesting and contributes new information about bronchial hygiene techniques in mechanically ventilated subjects. This randomized clinical trial investigated the use of a device designed to optimize the cleaning of the endotracheal tube. This device is a sterile thin flexible catheter with a cleaner at its distal tip that can be activated. The catheter is first inserted into the endotracheal tube and, when activated, forms a disc-shaped wiper that gently presses on the inner wall of the tube. The catheter is removed over a period of 3–5 s, eliminating secretions by scraping the inner wall of the tube. The authors demonstrated that this device was effective in reducing the rate of ventilator-associated pneumonia and in reducing the obstruction of the endotracheal tube, which was assessed by high resolution computed tomography ($P = .04$).

The device evaluated addresses some issues related to safety, such as graduated markings and an adjustable safety guide to avoid overinflation of the disc and a security lock on the handle preventing unwanted activation. A positive

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aspect of this study is the assessment by computed tomography scan, which quantified the precise degree of luminal narrowing inside the endotracheal tube. However, other devices designed to optimize the hygiene of the endotracheal tube have already been successfully tested.^{6–9} These devices^{6–8} are similar to the one studied by Pinciroli et al⁵ and consist of catheters with devices on their distal ends for endotracheal tube cleaning. These devices are also safe^{6,7} and effective to remove secretions.^{6–10} The difference between the device studied by Pinciroli et al⁵ and the others^{6–10} is the added safety, which is relevant for invasive procedures.

The device studied by Pinciroli et al⁵ has a significant potential for use in clinical practice. However, it is necessary to investigate other important outcomes, such as mortality and cost.¹¹ It is also important to compare this device with other devices available. The penetration of this device into practice might be limited until its cost-effectiveness is known.

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