

# Combined Tracheal Suctioning and Expiratory Pause: Novel Theory but Tricky Implementation

Amol T Kothekar<sup>1</sup>, Amit M Narkhede<sup>2</sup>

*Indian Journal of Critical Care Medicine* (2020); 10.5005/jp-journals-10071-23339

We read with interest the research article by Forgiarini et al., studying the combined effects of tracheal suctioning and expiratory pause on mechanically ventilated patients.<sup>1</sup> We congratulate the authors for a great effort to study the effects of end-expiratory pause on tracheal suctioning. End-expiratory pause is a safe and useful intervention and has application in the detection of auto-positive end-expiratory pressure (auto-PEEP) and also fluid responsiveness.<sup>2,3</sup>

We would like to raise a couple of queries related to the article.

First, the authors mention the use of 10-second expiratory pause in patients who are sedated and under controlled mechanical ventilation. Ventilator usually terminates the end-expiratory pause maneuver prematurely when the patient trigger is detected. Monnet et al., during their study of end-expiratory occlusion test for fluid responsiveness, had noticed this issue in 10 out of 44 patients (22%) leading to exclusion of these patients from the study.<sup>3</sup> We would like to know whether the authors did face similar problems and had to exclude many patients from the study. We believe that the incidence of trigger in the present study may be higher due to repeated (three times) suctioning causing stimulation of airway mucosa, especially with subsequent suctioning procedures.

Second, the authors mention that “suctioning was performed in a closed system with a 10-second expiratory pause activated

<sup>1</sup>Department of Anesthesia Critical Care and Pain, Tata Memorial Centre, Homi Bhabha National Institute, Mumbai, Maharashtra, India

<sup>2</sup>Department of Critical Care Medicine, Jupiter Hospital, Thane, Maharashtra, India

**Corresponding Author:** Amol T Kothekar, Department of Anesthesia Critical Care and Pain, Tata Memorial Centre, Homi Bhabha National Institute, Mumbai, Maharashtra, India, Phone: +91 9769633568, e-mail: amolkothekar@yahoo.com

**How to cite this article:** Kothekar AT, Narkhede AM. Combined Tracheal Suctioning and Expiratory Pause: Novel Theory but Tricky Implementation. *Indian J Crit Care Med* 2020;24(1):82.

**Source of support:** Nil

**Conflict of interest:** None

directly on the ventilator.” The application of suction to the closed circuit would lead to drop in airway pressure and base flow. With most of the modern ventilators, this leads to termination of the end-expiratory pause maneuver due to ventilator falsely sensing it as a patient trigger. This phenomenon can happen even in paralyzed patients and can be easily demonstrated with test lung (Fig. 1) as well. Hence, we would like to know the exact methodology and timeline of application of expiratory pause and closed suction.

To conclude, we appreciate the researchers for their efforts to put forth a novel way of improving the care of ventilated patients. Further clarification of the queries regarding the incidence of triggering and the exact methodology from the authors may help in the application of this intervention in clinical practice.

## REFERENCES

1. Forgiarini L Jr, Martins LD, Naue WD, Skueresky AS, Bianchi T, Dias AS. Effects of combined tracheal suctioning and expiratory pause: a crossover randomized clinical trial. *Indian J Crit Care Med* 2019;23:454–457.
2. Gottfried SB, Reissman H, Ranieri VM. A simple method for the measurement of intrinsic positive end-expiratory pressure during controlled and assisted modes of mechanical ventilation. *Crit Care Med* 1992;20:621–629.
3. Monnet X, Osman D, Ridel C, Lamia B, Richard C, Teboul JL. Predicting volume responsiveness by using the end-expiratory occlusion in mechanically ventilated intensive care unit patients. *Crit Care Med* 2009;37:951–956.



**Figs 1A and B:** (A) End expiratory pause using test lung; (B) Termination of end expiratory pause after opening of suction valve