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Mechanical Insufflation-Exsufflation Is Safe in Mechanically Ventilated Patients

In Reply:

We thank Guimarães and Rocha for their interest and comments regarding our study,¹ as well as the suggestions and doubts they advance. We have a few comments regarding their concerns. We believe it is important to emphasize that our objectives were to determine the safety of mechanical insufflation-exsufflation in mechanically ventilated, critically ill subjects, and to determine the efficacy of the device in the removal of respiratory secretions compared to standard physiotherapy.

Our colleagues questioned some aspects of the study, which we will respond to here. They suggest that secretion removal occurred predominantly from central airways, and we agree with this statement; however, we emphasize that this is the main objective of the maneuvers for respiratory secretion removal.^{2,3} It is impossible to know how long the effect of the maneuver may last

(30 min or 4 h), but it is reasonable to suggest that it follows the performance already demonstrated in patients with chronic neuromuscular disease. Because the hyperinflation technique was applied as part of routine patient care, there were no pressure or volume measurements during hyperinflation, and therefore it is not possible to affirm that this would displace more peripheral secretions than the 40 cm H₂O pressure exerted by mechanical insufflation-exsufflation. The technique of manual hyperinflation and thoracic compression were chosen for the control group because these techniques are used to remove secretions in intubated patients with some reports of success in the literature.²⁻⁴

We agree with Guimarães and Rocha that the heterogeneity of individuals may generate bias in studies measuring the quantity of secretions; however, as shown in Table 1 of our report,¹ both groups show homogeneity for previous pathologies, comorbidities, and other factors, reducing the possibility of selection bias. The randomized clinical trial design was chosen to reduce the possibility of bias, especially with the sample size of 180 subjects, which was based on findings with the same design in a smaller sample size.⁵ As for the method used to quantify the amount of secretions, weighing secretions is a commonly used technique in the literature.^{6,7}

We again thank the authors for commenting on our study¹ and their thoughtful suggestions. The main focus of our work was to verify the amount of secretions and to determine whether mechanical insufflation-exsufflation could be a useful airway-clearance technique in critically ill patients. Future studies should certainly be performed to assess outcomes such as days on mechanical ventilation, incidence of ventilator-associated pneumonia, and ICU mortality.

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