

To: Changes in respiratory mechanics during respiratory physiotherapy in mechanically ventilated patients

Para: Alterações da mecânica ventilatória durante a fisioterapia respiratória em pacientes ventilados mecanicamente

To the Editor,

We were very interested in the study by Moreira et al.⁽¹⁾ as it reflects common and routine respiratory physiotherapy practices in intensive care units in Brazil and other countries. We appreciate the author's effort in examining the evidence for this type of therapy. In this study, an improvement was observed in the ventilatory mechanics parameters after the application of a respiratory physiotherapy protocol in patients dependent on mechanical ventilation. The authors report a significant increase in dynamic pulmonary compliance, tidal volume, and oxygen saturation and a reduction in respiratory system resistance after application of the protocol. This protocol consisted of chest compression and vibration maneuvers, 0.9% saline instillation, and hyperinflation with a manual resuscitator, followed by endotracheal aspiration. However, we note the absence of a control group to help determine whether these gains were due to the use of the protocol and whether these gains could not be achieved with the endotracheal suction procedure alone.

According to the AARC Clinical Practice Guidelines - Endotracheal Suctioning of Mechanically Ventilated Patients with Artificial Airways,⁽²⁾ the decrease in peak pressure and airway resistance and the increase in dynamic compliance and tidal volume are expected and desired outcomes for endotracheal suctioning procedures and, therefore, a confounding factor for the effectiveness of the proposed therapy.

The authors also did not report any peak airway pressure controls during hyperinflation with the manual resuscitator, which may compromise the safety of the procedure. Peak pressures above 40cmH₂O may be associated with alveolar overdistention and the risk of barotrauma, suggesting, for safety reasons, the use of manometers coupled to a manual resuscitator during these maneuvers.⁽³⁻⁵⁾

Conflicts of interest: None.

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AUTHORS' RESPONSE

Resposta dos autores

We would like to thank you for your comments. Several respiratory physiotherapy techniques are used in critically ill patients.⁽¹⁾ However, the evidence for the use of multimodal respiratory physiotherapy is conflicting.⁽²⁾ Even the Clinical Practice Guideline of an important respiratory care society is based on the experience of specialists and not on the results of randomized clinical trials because of lack of evidence.⁽³⁾

Regarding the first question raised, our study protocol followed a sequence of techniques. After mobilizing the secretions from the distal airways using compression and vibration maneuvers and manual hyperinflation, the method to remove the secretions focuses on tracheal aspiration. This, in turn, only succeeds in removing the secretions located up to the third bronchial generation. Thus, it should be preceded by the techniques used in this protocol. It would be inconsistent to not aspirate secretions removed from the distal airways to the proximity of the endotracheal tube because this could lead to patient-ventilator asynchrony, respiratory distress, endotracheal tube obstruction, and increased respiratory effort.

As noted in the letter, the simple act of performing tracheal aspiration can improve respiratory mechanics. However, this procedure should not be performed systematically because it can lead to complications

including a decrease in dynamic pulmonary compliance and functional residual capacity, atelectasis, hypoxemia, a bronchoconstrictor response, and arrhythmias.⁽⁴⁾ The practical guide itself reports that this procedure, which is frequently used in patients on mechanical ventilation, can cause such complications.⁽³⁾ Therefore, we believe that the improvements in mechanical ventilation occurred because of the sequence of the procedures, which culminated in tracheal aspiration.

In response to the second question, we did not use a manometer for monitoring during the hyperinflation maneuver with a manual resuscitator because our equipment has a safety valve that prevents the airway pressure from exceeding 40cmH₂O; therefore, there is no need to monitor the pressure using a manometer.

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