

Effect of Positive Expiratory Pressure Device (Acapella choice) on lung recruitment in ICU high-risk patient

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Abstract

Background: Postextubation Positive Expiratory Pressure Device (Acapella choice) is used as a support therapy in high-risk patients in ICU. This study aimed to determine the effects of Acapella® therapy on lung recruitment assessed by electrical impedance tomography (EIT).

Methods: Twenty-five patients who received Acapella® therapy within 24 h after extubation were prospectively enrolled in this study. EIT was used to monitor regional lung ventilation distributions at baseline (conventional oxygen therapy) and 5 levels of Acapella® therapy (1, 2, 3, 4, and 5). Change of end-expiratory lung impedance ($\Delta EELI$), regional recruitment (recruited-pixels), GI and RVD index were determined by EIT. EIT images were equally divided into four ventral-to-dorsal horizontal regions of interest (ROIs 1, 2, 3, and 4).

Results: When the level gradually increased from baseline to Level 5, a significant and consistent increasing trend of global $\Delta EELI$ 15.5(%) ($p = 0.0038$) was observed. Moreover, the increase of $\Delta EELI$ was mainly distributed in ROI3 21.5 (%) ($p = 0.001$) and ROI4 1.8% (%) ($p < 0.0001$).

Conclusions: Using EIT could identify diverse effects of Acapella® therapy on lung regional ventilation in postextubation situations. Further study is required to validate using “Acapella® therapy effect” based on lung recruitment by EIT in clinical practice.

