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Predictive value of end-tidal CO₂, lung mechanics and other standard parameters for weaning neurological patients from mechanical ventilation

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Background: Neurologic related respiratory failure from severe central nervous system dysfunction is one of the most frequent reasons for initiating mechanical ventilation. The present study aimed to determine the value of EndTidal CO₂ and lung mechanics as predictors of extubation failure in different neurological patients who were putting on mechanical ventilation.

Methods: 32 critically ill neurological patients were admitted to the general ICU with acute respiratory failure due to variable neurological insults including acute stroke, drug abuse, toxins, and C₄ lesion. The patients were assessed for the following outcomes measures: Lung mechanics (compliance, airway resistance and MIP), ETCO₂, and the other standard weaning success indices including; PaO₂/FiO₂, pH, and rapid shallow breathing index (RSBI) (respiratory rate/tidal volume) at subsequent times: Initially on the beginning of using MV, and finally before extubation.

Results: Successfully weaned patients represented 56.2% (n=18) of all patients included in this study. They had a significantly lower MV duration (3.75±1.8 days) and had a significantly higher Glasgow Coma Scale (13.16±1.29) than the failed weaning group. Logistic regression analysis showed a significant association between failure of weaning and each of age, MV duration, Glasgow Coma Scale <13(GCS), ETCO₂ 621.1 and MIP≥16.

Conclusion: We concluded that measurements of RSBI, MIP (maximum inspiratory pressure), EndTidal CO₂ and dynamic compliance were more accurate predictors of extubation failure in patients with neurological insults than other standard weaning parameters.

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