Finding the best strategy to improve weaning outcomes

Respiratory muscle dysfunction, being a common cause of weaning failure, is strongly associated with prolonged mechanical ventilation (MV) and prolonged stay in intensive care units. Strategies to improve weaning outcomes – i.e., spontaneous breathing trials, noninvasive MV and early mobilisation – can help patients to interrupt MV, according to a review paper published in the journal Respiratory Medicine.

Identifying strategies to reduce the duration of MV and to restore ventilatory autonomy is an immediate priority from the moment of its commencing. To date, results are still controversial and the best strategy has not yet been established, due to the multifactorial origin of liberation from mechanical ventilation. Inspiratory muscle training (IMT) has been described as an important contributor to the treatment of respiratory muscle dysfunction in critically ill patients. Its effectiveness however remains controversial.

The aim of this review is to discuss evidence for assessment of readiness and the effectiveness of interventions for liberation from MV, with special attention to the role of IMT. PubMed, LILACS, PEDro and Web of Science were searched for papers of assessment and treatment of patients who failed liberation from MV after at least one attempt published in English or Portuguese until June 2016.

The review team found that weaning predictors are related to weaning success (86%–100% for sensitivity and 7%–69% for specificity) and work of breathing (73%–100% for sensitivity and 56%–100% for specificity). Spontaneous breathing trials (SBT), noninvasive MV and early mobilisation have been reported to improve weaning outcomes.

Notably, two modalities of IMT were identified in five selected studies: 1) adjustment of ventilator trigger sensitivity, and 2) inspiratory threshold loading. Both IMT training modalities promoted significant increases in respiratory muscle strength. IMT with threshold loading showed positive effect on endurance compared to control.

This analysis, according to the review team, indicates that further research should be encouraged to investigate new therapeutics and tools for the assessment of respiratory muscle function.

"The current rehabilitation strategies to prevent or treat respiratory muscle dysfunction are still scarce and mostly targeting higher respiratory muscle strength," the authors write. "Moreover, spontaneous breathing trials as a surrogate marker of endurance training have not been investigated in recent years. In this context, the use of individualised protocols combining different assessment and therapeutic modalities may be promising to be successfully applied to ameliorate muscle weakness and functional status."

Source: Respiratory Medicine
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