Extubation of Patients With Neuromuscular Weakness

A Routine Step or a Challenging Procedure?

To the Editor:

We read with great interest the article by Bach et al in a recent issue of CHEST (May 2010) concerning the application of continuous volume-cycled noninvasive ventilation (NIV) and mechanically assisted coughing (MAC) to successfully extubate patients with neuromuscular disease (NMD) after an episode of acute respiratory failure (ARF). In fact, considering that extubation failure is associated with adverse outcomes, including higher hospital mortality, greater need for tracheostomy, and longer stay in the ICU, the finding that standardized use of NIV and cough assistance leads to effective extubation of almost all patients with NMD who are designated as “unweanable” is of critical importance, supporting the argument that timely provision of inspiratory and expiratory aids enables virtual elimination of extubation failure in patients with neuromuscular weakness. However, based on our personal experience, we feel that this conclusion is overenthusiastic and that patients with NMD may still encounter particular difficulties while being liberated from the endotracheal tube. In fact, although we agree that weaning protocols based on ventilatory and cough assistance have the potential to expedite weaning time and reduce mortality for patients with NMD, we believe that the ability to adequately protect the upper airway is crucial to the success and safety of the weaning process and that extubation remains problematic for a significant proportion of patients with neuromyopathic conditions because of the severe risk of aspiration of food and saliva.

In line with this consideration, Bach and colleagues excluded from their study group any patients with advanced nonverbal bulbar amyotrophic lateral sclerosis, which is usually characterized by a relevant swallowing impairment; in addition, they reported a lower extubation success rate for infants with spinal muscular atrophy; in addition, they reported a lower extubation success rate for infants with spinal muscular atrophy type 1, partly because of more severe bulbar-innervated muscle dysfunction. However, in their recent article, they fail to emphasize that dysphagia with inability to handle oropharyngeal secretions and significant risk of inhalation is a common occurrence in many patients with NMD and that tachypnea, dyspnea, and continuous NIV after extubation may hamper swallowing efforts.

This said, we believe that careful evaluation of deglutition ability should be recommended when deciding to make an extubation attempt on a patient with neuromuscular weakness. In particular, the Gilardeau score, which provides a functional classification of deglutition impairment in patients with NMD, could be calculated before intubation and included among extubation criteria, with the caveat that individuals with higher scores might have to be excluded from extubation and administered tracheostomy because of the excessive risk of aspiration.

A second concern regarding the protocol proposed by Bach et al is that it may render extubation an extremely labor-intensive procedure since MAC may be required up to every 30 min to clear secretions and maintain or return pulse oximetry saturation levels to ≥ 95%. In this situation, even though a standardized weaning procedure is in place, one cannot expect that the nursing and respiratory therapy staff will follow it with a high rate of adherence, particularly during the nighttime hours when a different pattern of personnel assignment may allow less-close patient observation. As a consequence, support from the family or other properly trained nonprofessional care attendants becomes essential, according to the opinion of the authors themselves. Application of the weaning protocol thus may be a serious problem for all those individuals whose relatives do not have enough time or are incapable of correctly following a procedure that requires such strenuous care of the hospitalized patient. In conclusion, although we are greatly impressed by the results of Bach and coworkers, our opinion is still uncertain: Should now we consider extubation of patients with NMD after ARF as a routine step or does it remain a challenging procedure?

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REFERENCES


Response

To the Editor:

I appreciate the letter from Dr Vianello et al about difficulties when extubating patients who are unweanable. Airway protection is, indeed, critical. However, as reported in 1994, if the glottis is sufficient to permit assisted cough peak flows (CPFs) of 160 L/min, then aspiration of saliva does not decrease baseline pulse oxymoglobin saturation (SpO₂) < 95% (the only indication for tracheotomy in amyotrophic lateral sclerosis), and 98 of 98 such extubations were...