Comparison of Approaches to Spontaneous Breathing Trial for Extubation: Is PAV+ Better Than Other Methods?

To the Editor:

We have read with interest the RESPIRATORY CARE article entitled "Comparison of proportional assist ventilation plus, T-tube ventilation, and pressure support ventilation as spontaneous breathing trials for extubation: a randomized study" by Teixeira et al.[1]

A spontaneous breathing trial (SBT) is aimed at assessing the readiness for liberation from mechanical ventilation. The 3 usual approaches to an SBT are T-tube, low level of CPAP (5 cm H_2O), and pressure support ventilation (5−8 cm H_2O), usually performed for a minimum of 30 min to a maximum of 120 min. A tolerance of the SBT for this duration should prompt assessment for extubation. The SBT trial is better in assessing readiness for extubation than dependency on weaning parameters.[2] Teixeira et al[1] have examined proportional assist ventilation plus (PAV+) as a new approach for the SBT and aimed to assess the applicability, safety, and efficacy.

The results improve our understanding of the mode PAV+ and the impact of ICU stay on extubation outcome. However, we see certain important issues related to the methods and results of the study.

First, with respect to the methodology, we believe that instead of simple draw and non-blinded study, the investigators could have used a block-randomized and blinded study to obtain an equal number of subjects across the intervention. This would have avoided the high number of subjects undergoing T-tube trial. We question the predictive value of the cuff leak test in predicting upper airway edema.[3-5] Routine usage may pose a risk of development of ventilator-associated pneumonia.[6]

Second, with respect to the results section, in Table 1, the reason for admission could have been represented in 2 categories, namely neurological and non-neurological causes. This would give a subject representation of 60% non-neurological cases and 40% neurological cases. If the interventions were classified according to this category, the results would show a greater preference for the T-tube trial by the clinician for neurological cases and an equal preference for T-tube and pressure support ventilation for non-neurological cases. The need for noninvasive ventilation was reported as 22.5%, and the comorbidities (COPD) represented 22.5%, so we would like to know whether all COPD subjects required noninvasive ventilation postextubation. It is interesting to note that despite the Glasgow coma score pre- and postextubation being >10, 15% of subjects failed extubation; this further proves the observation made by Koh et al.[7] The reported extubation failure is 15%, which is less than the highest rate for re-intubation reported by Esteban et al, which is 47%.[8]

Although the authors mentioned sensitivity and specificity of PAV+ (97.6 and 66.6%, respectively) in the abstract of the paper, inclusion of complete data (T-tube, pressure support ventilation, and PAV+) mentioning the sensitivity and specificity along the receiver operating characteristic curve representation in the paper would have been ideal. In Table 2, it is interesting to note that, when compared with other groups, the requirement of a tracheostomy among subjects who underwent T-tube trial was much less. Does this mean that the sensitivity and specificity of the T-tube trial in predicting extubation was better than that of pressure support ventilation and PAV+? Some of the results in Tables 1 and 2 could have been represented in median and interquartile range.

In Table 3, the time spent in the first SBT reported for the T-tube trial was 35.3 ± 7.5 min; does this mean that there were subjects who did not receive a minimum of 30 min SBT? Since no complications were reported by the authors, is it reasonable to conclude that PAV+ can be utilized for an SBT even in patients with neurological injury. We support the idea proposed by Kacmarek et al[9] that the mode of ventilation applied once the patient begins to trigger inspiration has an effect on time to extubation.

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