Abstract

Introduction: Tolerance of a spontaneous breathing trial (SBT) is an evidence-based strategy to predict successful weaning from mechanical ventilation[1]. Some patients may not tolerate the trial because of the respiratory load imposed by the endotracheal tube. Automatic tube compensation (ATC), specifically developed to overcome the resistance caused by the artificial airways, appears ideally suited for the weaning process.

The aim of the work: was to To compare the effect of (SBT) with ATC and PSV on the course and outcome of weaning from mechanical ventilator.

Patients and Methods:

The study was prospective, randomized done on 60 adult patients (34 males and 26 females) admitted to the Critical Care Medicine Department in the Cairo University Hospital presenting with acute respiratory failure and mechanically ventilated for at least 24 hours of mechanical ventilation .once meeting defined criteria for a weaning trial, patients underwent a one-hour spontaneous breathing trial with either ATC (n =35) or pressure support ventilation (PSV; n=25). The following data were recorded and compared between the 2 groups immediately before and at the end of the spontaneous breathing trial: Vital signs, ABG , respiratory parameters including lung compliance , airway resistance , intrinsic PEEP , R/Tv ratio, peak airway pressure and plateau pressure. Those tolerating the trial were immediately extubated.

Results

There were no significant differences in any of the baseline characteristics between the two groups. Regarding the respiratory parameters, there were significant differences between the two groups at the end of the trial as regards SPO_2, PaO_2, PaO_2/ FIO_2 ratio, dynamic compliance , airway resistance and auto PEEP (P value <0.05).we found improvement in these parameters in ATC group than in PSV group. In the ATC group, 20 of 35 (57.1%) patients tolerated the breathing trial compared with only 15 of 25 (42.9 %) in the PSV group; this observed 14.2 % difference, however, did not reach statistical significance (p = 0.66). As regards the predictors of successful weaning, we found that specificity was highest for R/Tv ratio (91.2%) followed closely by PaO_2 (90.6%) and also positive predictive value was highest for R/Tv ratio (91.7%) followed closely by PaO_2 (91.5%).

Conclusions:

This study confirms the usefulness of ATC during the weaning process, being at least as effective as PSV in predicting successful weaning.

Key words: spontaneous breathing trial - weaning - endotracheal tube - mechanical ventilation- automatic tube compensation- artificial airways.