Evaluation of the Success of Endotracheal Extubation Following Weaning from Mechanical Ventilation in a Level 3 ICU

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Mechanical ventilation (MV) supports ventilation in patients with respiratory failure. Prolonged ventilation is associated with many complications and increased Intensive Care Unit morbidity and mortality. Hence, successful weaning with gradual reduction of ventilatory support, enabling patients to breathe independently, followed by extubation at the most appropriate time, is crucial. Different ventilatory modes, such as pressure support ventilation (PSV) and Continuous positive airway pressure (CPAP), are used to facilitate this transition by providing pressure assistance at the alveolar level. A failed extubation leads to the re-establishment of intubation. Extubation is advisable once the CPAP and PSV are at approximately 5 cm H_2O. The traditional method is to extubate the patient after a T-piece trial without supported pressure. The unit policy for extubation is to extubate directly without the T-piece trial. This study aims to assess the extubation processes and the factors influencing them through a retrospective observational study. We included 21 mechanically ventilated patients aged 18–80 years. Pediatric and obstetric neurological disorders, thoracic trauma, thoracic surgery, tracheostomy and patients in a vegetative state were excluded. Data were extracted on demographic details, success of extubation, need for reintubation, ventilation modes used, suctioning through the endotracheal tube, and bronchodilator use. Associations were analyzed using Fishers exact test. The mean age of the sample was 55.8 ± 15.9, with 57.1% being males. The extubation success rate was 76.19%, while the reintubation rate was 14.28%. Most patients were directly extubated (57%), while 9% underwent a T-piece trial. CPAP of 5 cmH_2O and PSV 8-10 cmH_2O were used before extubation. Suctioning was performed in 81% of cases, but 30 minutes before extubation. Bronchodilators were administered to 95.2% of patients 30 minutes after. The use of low sedation was statistically significant for extubation success ($p=0.048$), whereas ventilation modes used initially and during the weaning phase, and bronchodilator usage, were not significant ($p>0.05$). The high rate of extubation success justifies maintaining positive pressure in the lungs without interruption by the T-piece or suctioning before extubation.

Keywords: mechanical ventilation, weaning, extubation