



Non-invasive ventilation in COVID-19 patients – high vs low PEEP

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Introduction: Positive end-expiratory pressure (PEEP) is a positive pressure that remains in the airway at the end of expiration, decreasing atelectasis and improving ventilation-perfusion (VQ) mismatch. Ideal PEEP value is one that enables the preponderance of potential benefits over potential complications. Use of non-invasive ventilation (NIV) in COVID-19 patients with acute respiratory distress syndrome (ARDS), although still debatable, is associated with decreased mortality. Recent studies suggest that high PEEP ventilation decreases atelectrauma, pulmonary oedema, reduces the risk of patient self-inflicted lung injury and helps patients to breathe easier.

Aim: Assessment of respiratory response to high PEEP NIV in COVID-19 patients.

Materials & Methods: A retrospective cohort study was conducted in the COVID-19 intensive care unit (ICU) of University Hospital Centre Zagreb. Study included 93 patients treated with NIV from October 2021 to February 2022. PEEP values and respiratory frequencies (RF) were observed and HACOR score was calculated on 1st, 3rd and 7th day of hospitalization. The definite outcome was objective and subjective assessment of work of breathing.

Results: Out of 93 patients treated with NIV, 40 (43.0%) patients required a switch to invasive mechanical ventilation. For 53 (57.0%) patients, NIV was the only ventilation method for their entire stay in ICU. There was a statistically significant difference between 1st and 3rd ($p=0.005$), and 1st and 7th day ($p=0.010$) in RF. A statistically significant difference was found for HACOR scores ($p<0.001$) between 1st and 3rd day of hospitalization. Patients requiring intubation had higher HACOR scores. Additionally, it was found that for each point of the 7th-day HACOR score, the risk of NIV failure was 66% higher ($p=0.003$).

Conclusion: Treatment of COVID-19 ARDS with high PEEP NIV reduces the work of breathing, improves oxygenation, and helps patients feel comfortable and breathe easier.

Keywords: COVID-19, Non-Invasive Ventilation, PEEP