

European Respiratory Society Annual Congress 2013

Abstract Number: 4661

Publication Number: P2495

Abstract Group: 2.2. Noninvasive Ventilatory Support

Keyword 1: Ventilation/NIV **Keyword 2:** Intensive care **Keyword 3:** Mechanical ventilation

Title: The influence of obesity on non-invasive ventilation (NIV) responses in patients with acute hypercapnic respiratory failure

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Body: BECKGROUND: Obesity rates are increasing in general population and also prevalent in intensive care units (ICUs). The respiratory changes associated with obesity extend from a simple change in respiratory function, with no effect on gas exchange, to the more serious condition like hypercapnic respiratory failure, characteristic of obesity hypoventilation syndrome. The optimal noninvasive mechanical ventilation (NIV) strategy is often not used during ICU treatment of this patients. The aim of this study was to assess the differences of NIV strategies and outcomes of obese and non-obese patient with acute hypercapnic respiratory failure. METHODS: In this retrospective cohort study 20 patient ventilated with face mask were studied. Patient were divided into two groups: obese (BMI>35 kg/m²) and non-obese (BMI <35 kg/m²). The influence of BMI, initial level of PaCO₂ on pressure, mode, ventilator and time necessary to reduce PaCO₂<7kPa were investigated. RESULTS: The mean age of the patients was 65.4±7.6 years. The main reason for ICU admission was hypercapnic respiratory failure. Eleven patients were obese and nine was with BMI <35 kg/m². Obese patients required higer end-expiratory pressure levels and more time to reduce thir PaCO₂ levels (p 0.09), average time was 13.1 days. CONCLUSION: These result suggest that improvement of hypecapnia in obese patients may require higher PEEP levels and longer aplication time of NIV during acute hypecapnic respiratory failure than in non-obese patients.