ICU
MANAGEMENT & PRACTICE

OptiTHO Trial - Early NIV and HFNC-O2 vs COT and Late NIV

Non-invasive ventilation (NIV) in blunt chest trauma patients without immediate life-threatening injuries is commonly used to prevent the need for endotracheal intubation. However, the actual benefits of NIV in this context have not been extensively studied. Existing literature in this field has been limited by variations in study designs, patient severity and differences in comparators. Consequently, strong recommendations regarding the optimal timing for initiating NIV have not been established.

Current guidelines cautiously support using NIV to prevent intubation in selected patients with hypoxaemic respiratory failure (PaO_2/FiO_2 ratio < 200 mmHg). However, the use of early NIV in blunt chest trauma patients before the onset of respiratory distress or severe hypoxaemia is still a topic of debate. High-flow nasal oxygen therapy (HFNC-O_2) has shown promise as a reliable and well-tolerated alternative to conventional oxygen therapy (COT), with a notable reduction in intubation rates in patients with acute hypoxaemic respiratory failure.

A recent study compared the rate of endotracheal intubation between two NIV strategies in high-risk blunt chest trauma patients. The objective was to assess the benefit-risk ratio of these interventions in this patient population.

The OptiTHO trial was a two-year randomised, open-label, multicentre study. Study participants included 141 adult patients admitted to the ICU within 48 hours after high-risk blunt chest trauma, with a Thoracic Trauma Severity Score of at least 8, an estimated PaO_2/FiO_2 ratio of less than 300, and no evidence of acute respiratory failure. The primary objective of the study was to compare the rate of endotracheal intubation for delayed respiratory failure between two NIV strategies.

The first strategy involved promptly using HFNC-O_2 in combination with early NIV for at least 48 hours. The second strategy was the standard of care, which included COT initially and late NIV in patients with respiratory deterioration and/or a PaO_2/FiO_2 ratio ≤ 200 mmHg. The secondary outcomes of the study included the occurrence of chest trauma-related complications.

Of the 141 patients, 7.8% required endotracheal intubation for delayed respiratory failure. The rate of endotracheal intubation was not significantly lower in the group treated with the experimental strategy (7%) compared to the control group (8.6%). No significant difference was observed in the occurrence of pulmonary infection, delayed haemothorax, or delayed ARDS in patients treated with the experimental strategy.

Overall, these findings show that combining HFNC-O_2 with preventive NIV did not result in a lower rate of endotracheal intubation or reduced occurrence of secondary respiratory complications compared to the standard approach of COT followed by late NIV. Hence, the prompt association of HFNC-O_2 with preventive NIV does not provide additional benefit in this patient population.

Source: Critical Care

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