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High flow nasal cannula oxygen therapy in immunocompromised patients with acute hypoxemic respiratory failure

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Introduction

In the early 2000's, two randomized controlled trials have shown that non-invasive ventilation (NIV) could decrease mortality of immunocompromised patients admitted to ICU for acute respiratory failure (ARF) as compared to standard oxygen therapy (O_2) [1,2]. However, the benefits of NIV in immunocompetent patients with ARF failure are debated. High flow nasal cannula oxygen therapy (High-Flow Oxygen) may offer an alternative in hypoxemic patients. We recently found in a randomized controlled trial including 310 patients with ARF that High-Flow Oxygen decreased mortality as compared to NIV [3]. Immunocompromised patients could be also included in this study, except those with profound neutropenia. Therefore, we assessed the benefits of High-Flow Oxygen or NIV in this subgroup of patients.

Objectives

To compare intubation and mortality rates in the subset of immunocompromised patients admitted to ICU for ARF.

Methods

We performed a subgroup analysis of the FLORALI study. This study included all patients with non-hypercapnic ($PaCO_2 \leq 45$ mm Hg) ARF excluding patients with cardiogenic pulmonary edema and those with underlying chronic lung disease. Patients were assigned to three groups according to treatment: High-Flow Oxygen, O_2 or NIV. The primary outcome was the intubation rate and secondary outcome included 90-day mortality. We focused on the subset of immunocompromised patients included in this study, knowing that patients with profound neutropenia were excluded.

Results

Among the 310 patients with ARF, 82 (26%) were immunocompromised including 26 patients in the High-Flow Oxygen group, 30 in the O_2 group, and 26 in the NIV group. Intubation rates were 31%, 43% and 55% in the High-Flow Oxygen, O_2 and NIV groups, respectively ($p = 0.04$). The 90-day mortality rates were 15%, 27% and 46% in the High-Flow Oxygen, O_2 and NIV groups ($p = 0.046$). Ventilator-free days at day 28 were 26 ± 6, 23 ± 10 and 14 ± 13 days in the High-Flow Oxygen, O_2 and NIV groups, respectively ($p < 0.0001$).

Conclusions

In immunocompromised patients admitted to ICU for acute hypoxemic respiratory failure, High-Flow Oxygen was associated with lower intubation and mortality rates, and a reduced duration of invasive mechanical ventilation as compared to O_2 or NIV.

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