

**Non-invasive positive pressure ventilation versus endotracheal intubation in treatment of COVID-19 patients requiring ventilatory support**

Importance

Initial guidelines recommended prompt endotracheal intubation rather than non-invasive ventilation (NIV) for COVID-19 patients requiring ventilator support. There is insufficient data comparing the impact of intubation versus NIV on patient-centered outcomes of these patients.

Objective

To compare all-cause 30-day mortality for hospitalized COVID-19 patients with respiratory failure who underwent intubation first, intubation after NIV, or NIV only.

Design

Retrospective cohort.

Participants

Adult COVID-19 confirmed patients who required ventilatory support

Exposures

Patients were categorized into three exposure groups: intubation-first, intubation after NIV, or NIV-only.

Primary outcome

30-day all-cause mortality, a predetermined outcome measured by multivariable logistic regression. Covariates for the model were age, sex, qSOFA score  $\geq 2$ , presenting oxygen saturation, vasopressor use, and greater than three comorbidities. A secondary multivariable model compared mortality of all patients that received NIV (intubation after NIV and NIV-only) with the intubation-first group.

Results

A total of 222 were enrolled. Overall mortality was 77.5% (95%CI, 72–83%). Mortality for intubation-first group was 82% (95%CI, 73–89%; 75/91), for Intubation after NIV was 84% (95%CI, 70–92%; 37/44), and for NIV-only was 69% (95%CI, 59–78%; 60/87). In multivariable analysis, NIV-only was associated with decreased all-cause mortality (odds ratio [OR]: 0.30, 95%CI, 0.13–0.69). No difference in mortality was observed between intubation-first and intubation after NIV. Secondary analysis found all patients who received NIV to have lower mortality than patients who were intubated only (OR: 0.44, 95%CI, 0.21–0.95).

Conclusions

NIV as the initial intervention in COVID-19 patients requiring ventilatory support is associated with significant survival benefit. For patients intubated after NIV, the mortality rate is not worse than those who undergo intubation first

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