Comparison of Inhaled Epoprostenol and Inhaled Nitric Oxide for COVID-19 Induced ARDS in Critically Ill Adults

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Introduction

- COVID-19 was declared a pandemic by the World Health Organization (WHO) on March 11, 2020.[1]
- Two common complications of COVID-19 are pneumonia and acute respiratory distress syndrome (ARDS).[1]
- Survivors of the virus are at an increased risk of long-term negative physical and mental impairments.
- The purpose of the study was to compare the clinical impact between inhaled nitric oxide (iNO) and epoprostenol (iEPO) in mechanically ventilated patients with COVID-19 induced ARDS in the ICU.
- Primary aim: compare the maximum change of PaO2:FiO2 in 24 hours from baseline for both iEPO and iNO.
- Secondary aim: determine the in-hospital mortality and duration of therapy.

Methods

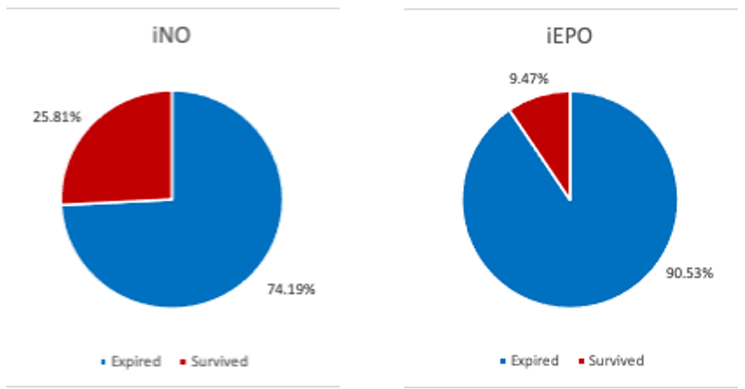
- Retrospective, cohort study at Banner Health Hospitals.
- Patients administered iNO or iEPO during their ICU admission were evaluated from Jan 2020-Jan 2022.
- Inclusion criteria: (1) ≥ 18 y/o ; (2) continuous administration of iNO or iEPO for ≥ 1 hour in mechanically ventilated patients admitted to the ICU; and (3) COVID-19 induced pneumonia (Pa_{O2} F_{IO2} < 150 mm Hg).
- Exclusion criteria: (1) >2 hours of concomitant iNO and iEPO administration; (2) indication of use was massive or submassive (pulmonary embolism (PE); (3) concomitant parenteral prostacyclin administration; or (4) extracorporeal membrane oxygenation (ECMO) at baseline.
- Primary Hypothesis: Both iEPO and iNO will be equally effective in improving PaO2: FiO2 levels in mechanically ventilated patients with COVID - 19 induced pneumonia in intensive care units.

Results

Table 1: Maximum Change in PaO2:FiO2 Ratio at 24 Hours from Baseline

	iEPO	iNO
Mean	12.17	15.30
Standard Deviation	59.18	90.49
95% Confidence Interval	(0.12, 24.23)	(-3.33, 33.94)
P-value	0.78	

In-Hospital Mortality



Duration of Therapy

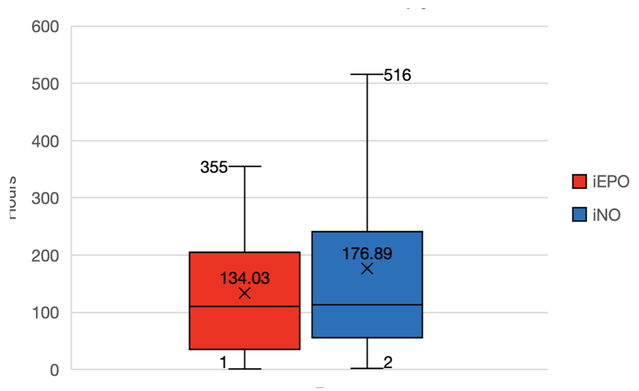


Figure 2 The duration of therapy was longer in the iNO group as compared to the iEPO group (Figure 2).

Discussion

- The maximum change in PaO2:FIO2 was not significant with a p-value of 0.7788. The mean change for iEPO was less than the mean change for iNO.
- There was no significant difference between the two groups in regards to the racial composition, mean age, mean height, and comorbidities.
- More patients were placed in prone position in the iEPO group (p=0.002) and more patients were paralyzed in the iNO group (p=0.003).

Conclusions

- There was no statistically significant difference in the maximum change of PaO2:FiO2 in 24 hours from baseline between the two study groups.

Limitations

- Data were only collected at one hospital system in Arizona and therefore may not be generalizable to other hospital settings.
- Arterial blood gases were not always available for pre-specified times which limited our sample size.

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