

Article Appraisal

**Article:**  Early Self-Proning in Awake, Non-intubated Patients in the Emergency Department: A Single ED’s Experience During the COVID-19 Pandemic

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**Resident Reviewer Name(s) and Residency Affiliation:** Xin Mei Liu, Vancouver PG2

**Faculty Methodology/Bio-statistics Resource Person:**  Dr Frank Scheuermeyer



**Background and Study Objective(s)**

In New York City, during the onset of the Covid-19 Pandemic, patient presented in high numbers to the emergency with moderate to severe hypoxia. With many of these patients being poorly responsive to supplemental oxygen, having x-ray findings like those found in acute respiratory distress syndrome (ARDS), and because of concerns around aerosolization during alternative oxygenation modalities, early intubation was the mainstay of treatment. Ventilators and critical care resources rapidly became limited. Previous ARDS literature speculated that proning of awake non-intubated patients could improve oxygenation and prevent or delay intubation. This study aims to describe the experience of a single urban academic ED with the use of early proning of awake non-intubated patients with Covid-19 and its impact on oxygenation.

**Study Design**

Prospective cohort study at a single urban academic emergency department in New York City

* No comparator groups
* Convenient sample of 50 patients recruited between March 1st and April 1st, 2020

Inclusion criteria

* Covid-19 positive via PCR
* 18 years old or above
* Presented to the ED with hypoxia (SpO2 <90%)
* SpO2 <93% despite supplemental O2
* Capable of self-proning

Exclusion criteria

* DNR
* Cardiac arrest
* Non-invasive ventilation
* Intubated in the pre-hospital setting

Intervention: self-proning/change position

Primary outcome: change in SpO2, determined prior to proning, after application of supplemental oxygen and after 5 minutes of proning – without change in FiO2.

Secondary outcome: rate of patients who were proned but then required intubation within 24 hours of presentation to the ED.

**Results**

Demographics

* Median age of cohort: 59 years old
* 60% were male
* 80% of the cohort was tachypneic on arrival (RR>20)
* 80% of patients arrived as walk ins, 20% with EHS

Oxygen saturation

* Overall median SpO2 @ triage 80% (IQR 69-85%)
* Median SpO2 improved to 84% (IQR 75-90) after application of supplemental O2 (non-rebreather mask or NP at about 5L/min)
* After 5 min of proning the median SpO2 increased to 94% (IQR 90-95)
* Comparison of the pre- to post- median by Wilcoxon Rank-sum test yielded P=0.001

Intubations

* 13 patients required endotracheal intubation within 24hrs
* Of those patients who were not intubated within 24 hours (n = 37), 5 were subsequently intubated as inpatients

**Validity of Results**

This study addressed a clearly focused issue and used reasonable pre-defined inclusion and exclusion criteria to recruit a convenient sample of 50 patients in an impressively short period of time. The measurements taken were the same as the ones we would use in any ED (oxygen saturation). The biggest limitation of the study is the absence of comparison groups. Additionally, the intervention was likely not standardized (no proning/position change protocol) and the researchers could not control for all aspects of care of the patients. There was also no reporting regarding intervention’s safety, and one would have to assume that there were no adverse events.

**Generalizability of Results:**

The study was performed in an urban academic centre in NYC. These results are likely generalizable to patient of similar severity of disease (hypoxic COVID-19 patients with poor response to supplemental oxygen). However, the healthcare system was overwhelmed in New York City, with critical shortage of beds, ventilators, PPE, personnel, and even oxygen. Therefore, the overall healthcare context was not generalizable.

**The Bottom Line:**

Awake proning of non-intubated patient is a low-cost and likely low-risk intervention that can improve the oxygen saturation of hypoxic COVID-19 patients. Without a control group, we do not know if it results in sustained improvement in SpO2 levels, decreases the need for intubation, or leads to mortality benefits. Currently, in the absence of harm or alternative intervention of similar ease of access, it is reasonable to attempt this intervention when selecting the right patient who can tolerate awake proning.

There are currently registered RCTs looking to further our understanding of awake proning in COVID-19 patients.

**Stimulus Questions:**

1. What are some considerations around completing research during a pandemic?
   * Rapid turn around of information
   * Limited access to patient care areas by research assistants
   * Limited PPE
   * Pressure to obtain breakthroughs that can help patients
   * Obtaining consent for research
2. How would you design an RCT to investigate whether awake proning benefits hypoxic Covid-19 patients?
   * Comparator group with either early intubation or NIPPV.
   * Follow patients for longer
   * Look for mortality benefit/need for intubation
3. What is the value of non-traditional sources of information like FOAM/Twitter/physician forums? ...does this change in the context of the Covid-19 pandemic?

Strengths

* + - Free/low cost
    - Ongoing iterative discussion/updates, sometimes about existing peer-reviewed evidence
    - Multiple small uncontrol data points that can add up
    - Largest benefit in emerging rapidly spreading disease

Weaknesses

* + - No peer reviews
    - Potential bias towards extremes of results/experiences
    - Individuals with similar opinions agglomerating and validating each other
    - Can mislead the public who cannot critically appraise the information

1. Will this study change your practice?
   * Live poll with the audience answering: Would you try proning hypoxic COVID-19 patients in the ED?
     + 60%: yes, based on this paper
     + 40% yes, was already doing it
     + 0%: no, need more evidence
   * People thought it was a low risk easy intervention to try that could benefit patients.