A case of improved oxygenation in SARS-CoV-2 positive patient on nasal cannula undergoing prone positioning

Sherif Elkattawy, DO *, Muhammad Noori, MD
Rutgers New Jersey Medical School, Trinitas Regional Medical Center, Department of Medicine, Elizabeth, NJ, USA

ABSTRACT
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causing coronavirus disease 2019 (COVID-19) has resulted in significant morbidity and mortality worldwide. It has placed societal and financial burden on the globe. Its rapid progressions from mild URI symptoms to severe acute respiratory distress syndrome (ARDS) in a matter of days is the underlying reason as to why the world is struggling to keep up with ventilator production. In this case report, we went about proning a corona virus positive patient for 6–8hrs as a potential early intervention to prevent progression to ARDS. Our patient was initially in acute hypoxic respiratory failure and placed on nasal cannula. He was started on hydroxychloroquine and azithromycin with no improvement of symptoms. However within the span of few hours of proning he experienced significant symptomatic relief with improvement of oxygenation. His oxygen saturation improved drastically and eventually was taken off of nasal cannula and discharged within span of one day of proning.

1. Introduction
Since December 2019, a novel virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causing coronavirus disease 2019 (COVID-19) has resulted in more than 45,000 deaths worldwide in over 150 countries. Patients can progress from asymptomatic or mild illness to hypoxic respiratory failure or multisystem organ failure, necessitating intubation and intensive care management. [7] Prone positioning is a technique well established in the management of intubated patients with acute respiratory distress syndrome (ARDS). [2] Studies have shown that the physiological changes associated with the prone position in nonintubated patients may be even more favorable than in intubated patients and that prone position may prove beneficial in some cases of hypoxic respiratory failure, even in awake patients, by avoiding mechanical ventilation and ventilator-associated complications. [6].

We examined the effect of proning on oxygenation saturation in a non-intubated patient positive for SARS-CoV-2 with hypoxic respiratory failure.

2. Case presentation
This is a 36-year-old male, with no significant past medical history, who presented to the emergency department with worsening fever, cough, shortness of breath and generalized body aches for ten days. Patient endorsed a nonproductive cough with associated intermittent nausea, vomiting and diarrhea. Patient admitted to generalized malaise, aches and chills. Denied chest pain, claudication, lightheadedness or dizziness. He reported symptoms were exacerbated with exertion and relieved with rest. As per the patient he was seen one week ago for similar symptomatology at another emergency department in which his Flu/RSV tests were negative and was discharged without any medications with the diagnosis of a viral upper respiratory tract infection and recommended to rest and hydrate.

Of note, patient is an IT proctor and reported two weeks ago he was in contact with a test taker who exhibited dry cough and rhinorrhea. He is unable to track what happened with the test taker. Furthermore, patient lives with a roommate who works at an airport and reported that his roommate started developing cough and fever three days after the patient started manifesting his aforementioned symptoms. Patient’s roommate was found to have the flu and was given Tamiflu, with significant improvement of symptoms.

In emergency department, patient was afebrile, tachycardic at 109 bpm, tachypneic at 33, and hypoxic at 85% on room air that improved to 99% on 4L NC. Labs were unremarkable. Chest X-ray showed bilateral mid and lower lung zone patchy hazy airspace opacities. CT chest w/ contrast showed multifocal pneumonia, predominantly involving the lower lobes. Negative influenza and RSV. He received one dose of vancomycin, zosyn and azithromycin in ED and was started on nasal cannula 4LPM. Patient was started on normal saline 2L at 1L/hr in emergency department and admitted to medical floors for community acquired pneumonia vs COVID-19 pneumonia on contact and droplet precaution.

* Corresponding author.
E-mail address: s.elattawy@yahoo.com (S. Elkattawy).
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Our patient had severe acute respiratory syndrome corona virus (SARS-CoV2) induced pneumonia as evidenced by characteristic laboratory and imaging findings. Significant improvement in patient’s oxygen saturation was noted after the patient was prone for at least 6–8 hours. Several studies have shown that in most patients with ARDS (up to 70%), prone ventilation increases PaO₂ allowing a reduction in the FiO2. Mure, M et al. reported a study showing the positive effect of prone positioning on oxygenation in patients with acute lung insufficiency. 12 out of 13 patient responded to treatment in prone positioning showing dramatic increase in oxygenation index and decrease in A-a gradient [5]. Although our patient did not meet the criteria for ARDS, his oxygen saturation improved clinically status post lying in prone position. This could’ve possibly been secondary to effects of hydroxychloroquine as well however it was stopped prior to proning without significant improvement in oxygenation. C. Valter et al. reported a case showing improvement of PaO₂ in non-intubated hypoxic respiratory failure with prone positioning [6]. To date very few studies have been published showing benefit of prone positioning in non-ARDS patients receiving non-invasive ventilation.

Currently a number of clinical trials are being performed regarding treatment modalities for SARS-CoV2 induced pneumonia. We believe most effective way to reduce morbidity and mortality is early intervention to prevent progression of disease. Prone positioning will be a vital part of management plan and will be a topic of interest in upcoming days. We are currently undergoing a case series at our institution to further validate the effects of proning on oxygenation in non-intubated patients.

Declaration of competing interest

We have no conflict of Interest to declare.

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