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Awake Prone Positioning in COVID-19 Patients Associated With Lower Rates of Intubation, Mortality

A retrospective observational study conducted in Mexico and Ecuador concluded that for COVID-19 patients who are hospitalized and nonintubated, the awake prone position (AP) is linked to a significantly lower risk for intubation and mortality compared with the awake supine position.

“Mexico is one of the countries that has been most affected by the COVID-19 pandemic,” said Orlando Pérez Nieto, MD, the principal investigator and an emergency and intensive care specialist at General Hospital San Juan del Rio, in Querétaro, Mexico, and an adjunct professor of the intensive care fellowship at Querétaro Autonomous University. “In this middle-income country, it is difficult to manage patients with mechanical ventilation, due to a dramatic shortage of ventilators and medications. Thus, we are trying to devise low-cost strategies to avoid intubation and decrease mortality.”

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The APRONOX study, published in the *European Respiratory Journal* (2021 Jul 15.

doi:10.1183/13993003.00265-2021), comprised 827 nonintubated patients with COVID-19 at 27 hospitals in Mexico and Ecuador from May 1 to June 12, 2020.

Patients were divided into two groups: the AP group (n=505) and the supine group (n=322). Both groups of patients were given at least 1 L of oxygen per minute. Fewer patients in the AP group required endotracheal intubation (23.6% vs. 40.4% in the supine group). The AP group also was associated with fewer deaths (20% vs. 37.9%, respectively).



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The AP strategy was a protective factor for intubation, even after multivariable adjustment (odds ratio [OR], 0.39; 95% CI, 0.28-0.56; $P < 0.0001$). This protective factor remained after propensity score analysis (OR, 0.32; 95% CI, 0.21-0.49; $P < 0.0001$) and for mortality (adjusted OR, 0.38; 95% CI, 0.25-0.57; $P < 0.0001$).

The three major variables linked to intubation among AP patients were increasing age, lower baseline blood oxygen saturation/fraction of inspired oxygen and management with a non-rebreather mask.

Pérez Nieto was not surprised by the study results because the benefit of prone positioning was demonstrated years ago in patients using mechanical ventilation for acute respiratory distress syndrome (ARDS).

“We felt the same rationale could be used in nonintubated patients,” he said.

One hindrance, however, in implementing AP as standard therapy in the study population is that “some obese patients cannot tolerate AP for long periods of time,” Pérez Nieto said. “But the security of AP in nonintubated patients has been previously shown in multiple trials.”

Because the study was observational, the investigators were unable to determine the timing of AP.

Christopher Tam, MD, an assistant professor of clinical anesthesiology at NewYork-Presbyterian/Weill Cornell Medical Center, in New York City, said he agreed that the study results were not surprising.

“During the height of the COVID-19 pandemic here in New York, many institutions were extremely limited in supplies, especially ventilators,” he said. “We found that prone positioning in nonintubated patients was a great option, which allowed for the prevention of some patients from requiring intubation.”

Prone positioning for nonintubated patients is also a cost-effective way to decrease ventilator use, particularly at a time of critical need, according to Tam, who was not part of the study.

“Furthermore, prone positioning offers improved lung function, without the pressure of the heart and abdominal organs compressing lung function,” he said. “Blood flow is also redistributed to areas that may not be diseased to offer improvements in gas exchange, therefore reducing dead space relative to the supine position in patients with ARDS.”

Although AP is beneficial for patients with ARDS, “it requires cooperation from the patient,” Tam said. “Laying in the prone position for extended periods of time can lead to discomfort and the possibility of pressure sores and ulcers. Hence, appropriate padding of pressure points is necessary.”

—Bob Kronemyer