Prone position improves oxygenation but not respiratory mechanics in mechanically ventilated Sars-Cov2 patients

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Introduction

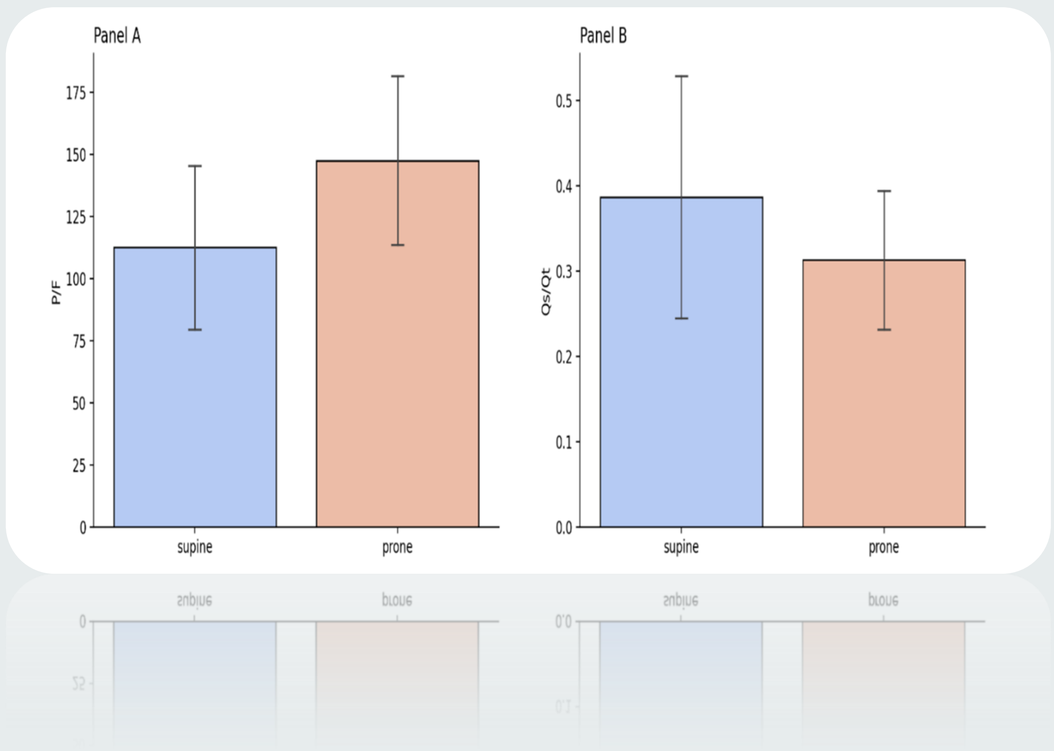
SARS-COV2 pneumonia causes profound hypoxemia poorly responding to O2 therapy similar to ARDS. Pronation has been used as treatment for classic ARDS demonstrating an improvement in lung mechanics and gas exchange1. The aim of the study is to assess the effect of prone position during mechanical ventilation in COVID-19 associated acute distress syndrome on gas exchange and respiratory mechanics.

Methods

Nineteen volume controlled mechanically ventilated patients with SARS-COV2 sedated and paralyzed who required prone position were enrolled between March 1st and April 15th. Same ventilatory settings were maintained between supine and prone position. Respiratory mechanics using a dedicated system (Colligo; Elekton, Milan, Italy) and arterial/venous blood gases were collected at supine position and 1 hour after pronation.

Results

Mean anthropometrics: age 62.5 ±6.8, BMI 30 ±6.6, SAPS-II 36 ±4.7. Mean ventilatory settings were: Vt 495 ±44mL (7.1 ±7.5mL/kg), Respiratory rate 18 ±2, PEEP 10 ±1 cmH2O, and FiO2 0,7 ±0.2, I:E=1:2. Plateau pressure and driving pressure (20 ± 2 vs 19.9 ± 2 cmH2O p=0.7, 10.5 ± 4.6 vs 11.2 ± 3.6 cmH2Op=0.2) as well as respiratory system elastance did not differ from supine to prone position (20.3 ±5.3 vs 19.4 ±4.6 p=0.6). CO2 clearance was the same between both positions (paCO2 53.6 ±10.7 vs 54.2 ± 7.4 p=0.65). Oxygenation in terms of P/F (Panel A, Fig 1) increased significantly in both positions while shunt fraction significantly decreased (0.39 ± 0.15 vs 0.31 ± 0.1 p=0.02) (Panel B, Fig 1).



Conclusion

Prone position improved gas exchange all in terms of oxygenation and not CO2 clearance, without apparently having a positive effect on respiratory mechanics. Partitioning of respiratory mechanics and a larger population may be needed to further investigate pathophysiology of SARS-COV2 related pneumonia.

Bibliography

1. Gattinoni L et al. doi: 10.1056/NEJMoa010043.