Orthodeoxia and its implications on awake proning in COVID-19 pneumonia

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Background

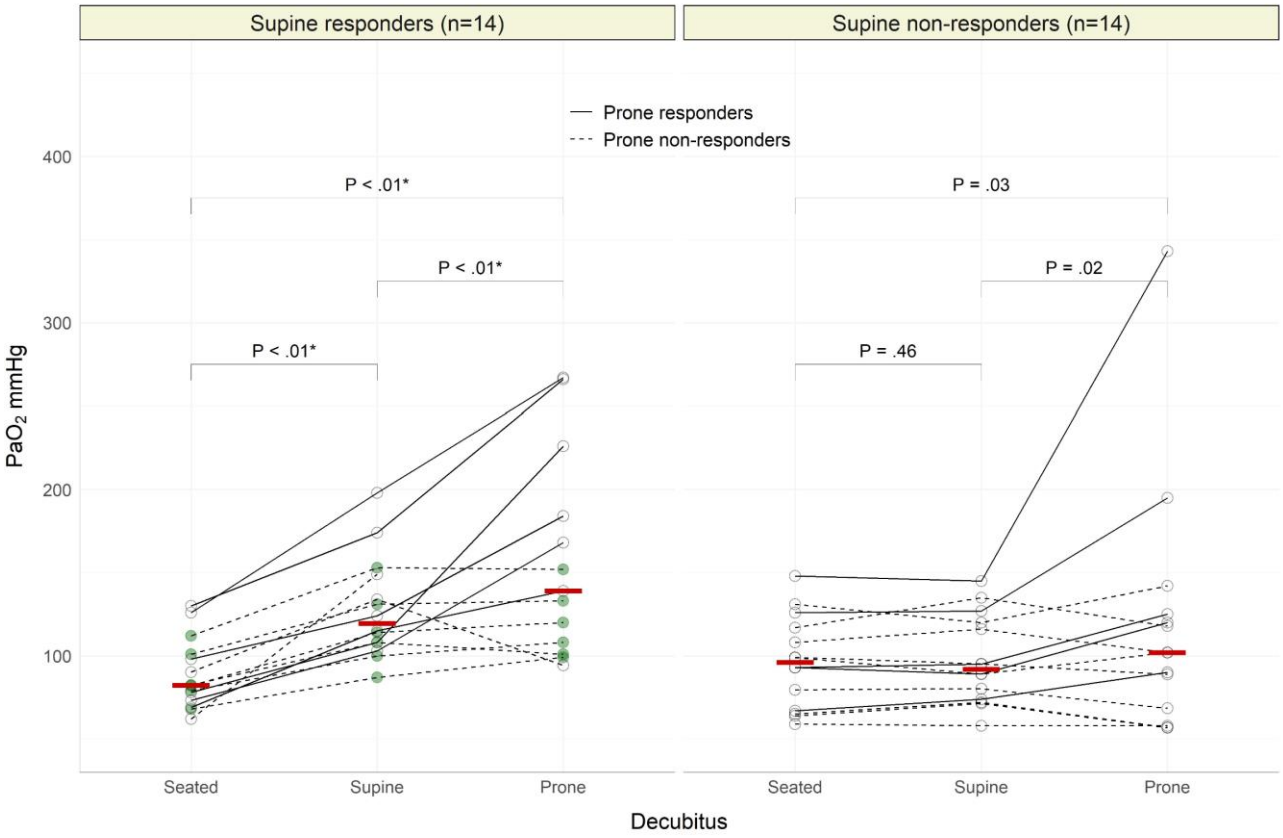
Orthodeoxia (orthostatic hypoxia relieved by supination) is a rare clinical finding associated with pulmonary vascular shunting. Since SarS-CoV-2 infection was previously shown to induce pulmonary vascular dysregulation, we hypothesized that orthodeoxia might be a feature of such disease. Its prevalence and implications on awake proning are here investigated.

Methods

Setting: double-center (Città della Salute and S.Luigi Gonzaga University Hospitals, Turin, Italy), before-after study. Population: spontaneously breathing COVID-19 patients with respiratory failure requiring CPAP or HFNC. Protocol: sequences of seated- supine-prone position (20 minutes each, arterial blood gases analyzed at the end). Main outcome: Supine-responders (increase in PaO_2 of ≥ 20% from seated to supine). Secondary outcome: Prone-responders (from supine to prone). Statistics: Wilcoxon-test, Fisher's exact-test (two-sided p<0.01 for significance).

Results

Twenty-eight patients were enrolled (22 CPAP, 6 HFNC). Median time from beginning of respiratory support was 2 [1-4] days. 14 patients (50%) were supine-responders (median PaO_2 increase: 31 [26-44] mmHg), 14 (50%) were supine-non-responders. During proning, PaO_2 significantly increased only in supine-responders. However, the number of prone-responders was similar in supine-responders and supine-non-responders (6 vs 5, *P* = .70). Of note, comparing proning to sitting rather than to supination would extend the definition of prone-responders to six more patients (**Figure**, green dots) whose oxygenation improvement was actually due to recumbency irrespective of prone or supine position specifically.



Discussion

Orthodeoxia is a common clinical feature of early COVID-19 pneumonia. This novel finding reinforces the role of vascular shunting and impaired hypoxic-vasoconstriction in the development of hypoxia. Response to proning might be overestimated if referred to seated (or semi-recumbent) position rather than to supination: almost 25% of patients increasing PaO_2 from seated to prone may actually experience the same improvement with a simple supination, thereby possibly avoiding the burden of awake pronation.