

Clinical and physiological effects of awake prone positioning in severely hypoxemic COVID-19 patients on high flow oxygen therapy

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Introduction & aims. High flow oxygen therapy and awake prone positioning in severely hypoxemic COVID-19 patients, appeared to be a safe rescue option but the mechanisms of action still remain to be fully understood.¹ Ehrmann S., et al. doi:10.1016/S2213-2600(21)00356-8 We then aimed to evaluate the acute physiological effects of the technique in this subset of patients.

Methods. Centre. An 11 COVID-19 beds High Dependency Unit of a University Hospital. **Study design.** Interventionist on the physiological and clinical effects of awake prone positioning. **Patients.** Suffering from COVID-19 related severe hypoxemia needing high flow oxygen therapy. **Measurements.** Patronymics, radiology, and the following before – after 30 minutes of prone positioning: clinics (breathing frequency, heart rate, oxygenation -SpO₂% and Rox-index- and ultrasound related measurements (Siemens®, L150, Co, USA) Apical and basal B lines, and diaphragmatic excursion. **Ethics.** Ethics approval and informed consent were previously obtained. **Statistics.** Data is expressed as mean±SD or median (interquartile range) and paired T test or Friedmann tests were applied. A p value of <0.05 was considered as significant.

Results. We studied 10 patients, age (y) 65.0±23.4, sex (M/F) 6/4, comorbidities (Charlson) 1.9±0.8, APACHE II score 5.4±2.3, radiological involvement (ImageJ®, NIH, Bethesda, USA) pulmonary area 132137±22358, density (RawIntDen) 5328292±1080158. The before and after prone positioning was respectively, breathing frequency (rpm) 33.4±4.6 vs 26.9±3.9 (p<0.05), heart rate (lpm) 88.5±15.5 vs 82.8±12.0 (p=0.3), SpO₂ (%) 89.5±9.2 vs 95.2±5.1 (p=0.1), iROX 4.5±0.72 vs 6.0±0.9 (p<0.05), Dispnoea (Borg) 2.3±0.7 vs 1.6±1.4 (p=0.7), apical B lines 2.3±0.7 vs 1.2±1.1 (p<0.05), basal B lines 1.9±1.3 vs 0.8±0.9 (p<0.05) y diaphragmatic excursion (mm) 20.7±7.7 vs 29.7±7.5 (p<0.05).

Discussion y conclusions. In patients suffering from COVID-19 related severe hypoxemia on high flow nasal cannula, 30 minutes of prone positioning resulted in an improvement breathing frequency, oxygenation and a better ventilation of anterior lung segments, leading to a hypothesis of an improvement on the ventilation/perfusion ratio.

Figure 1. A. Breathing frequency before and after prone positioning. B. ROXi before and after prone positioning. C. B lines before and after prone positioning. D. Diaphragmatic excursion before and after prone positioning.

