Category : **Respiratory: monitoring**

A192 - *Effect of prone position regarding respiratory work and gas exchange during spontaneous breathing in patients with acute hypoxemic respiratory failure due to Covid-19 pneumonia*

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Introduction:
Aim of the present study was to investigate the effect of prone position regarding respiratory mechanics and gas exchange during spontaneous breathing in patients with acute hypoxemic respiratory failure (AHRF) due to COVID-19 requiring helmet CPAP.

Methods:
Prospective enrolment of adults (>18 years) with AHRF due to, radiologically and laboratory confirmed, COVID-19 pneumonia. Inclusion criteria: PaO_2/FiO_2 ratio <300 mmHg and/or respiratory distress, requiring helmet CPAP. Exclusion criteria: unstable hemodynamics and Glasgow coma scale <15. Blood gas analyses, respiratory mechanics and oesophageal pressures were collected during supine position and 3 hours after the initiation of prone position. For statistical analysis, a fully scripted data management pathway was created within the R environment for statistical computing, version 3.6.1.

Results:
The results are shown in Table 1. In particular, we observed that prone positioning was associated with a PaO_2/FiO_2 ratio increase from 166 [136, 224] mmHg to 314 [232, 398] mmHg (p<0.001). Respiratory work, estimated as the product of oesophageal pressure, tidal volume and respiratory rate, decreased from supine (65 [46, 88] cmH_2O*L/min) to prone position (51 [34, 67] cmH_2O*L/min) (p<0.001). The reduction in respiratory work was due to a reduction in respiratory rate from supine (20 [17, 24] breaths per minute (bpm)) to prone position (17 [15, 19] bpm) and corresponded to an improvement in dyspnea assessed both subjectively by the patient (Borg dyspnea scale) (p 0.005) and objectively by the physician (Work of Breathing (WOB) score) (p 0.001).

Conclusion:
In this prospective cohort of spontaneously breathing patients affected by AHRF due to COVID-19 pneumonia, prone positioning was associated with an improvement in both gas exchange and respiratory mechanics. Widespread implementation of this easy to perform intervention could prove essential in improving critical care of non-invasively ventilated patients.

Table:

	Supine (N=40)	Prone (N = 40)	p
PaO2/ FiO2 Ratio, mmHg	166 [136, 224]	314 [232, 398]	<0.001
Respiratory Rate, breaths/min	20 [17, 24]	17 [15, 19]	<0.001
Esophageal Pressure, cmH2O	-7 [-9, -5]	-6 [-9, -5]	0.306
Pes * Respiratory Rate, cmH2O/min	152 [104, 197]	118 [90, 150]	<0.001

Pes*Tidal Volume*Respiratory Rate, cmH2O * L /min	65 [46, 88]	51 [34, 67]	<0.001
Tidal Volume, ml/kg	6.9 [6.0, 7.9]	6.9 [5.7, 7.9]	0.517
Stress, cmH2O	17 [14, 19]	16 [14, 18]	0.34

Table 1. Results