

Associations of Awake Prone Positioning–induced Changes in Physiology with Intubation — an international prospective observational study in patients with acute hypoxemic respiratory failure related to COVID–19

ONLINE SUPPLEMENT

Luis Morales–Quinteros^{1,2,3}, Raffaele Scala⁴, João Manoel Silva Jr.⁵, Antonio Leidi⁶, Alexandre Leszek⁶, Rodrigo Vazquez Guillamet⁷, Sergi Pascual^{3,8}, Ary Serpa Neto^{9,10,11,12}, Antonio Artigas^{2, 3,14}, Marcus J. Schultz^{9,13,15}

Hospital Universitari Sant Pau, Barcelona, Spain

¹Department of Intensive Care Medicine

Institut d'Investigació i Innovació Parc Taulí I3PT Universitat Autònoma de Barcelona Sabadell, Spain

²Translational Research Laboratory

³**CIBER Enfermedades Respiratorias (ISCiii), Madrid, Spain**

S Donato Hospital, Arezzo, Italy

⁴Pulmonology and RICU

Hospital das Clinicas, Sao Paulo, Brazil

⁵Department of Anesthesiology

Geneva University Hospitals, Geneva, Switzerland

⁶General Internal Medicine, Department of Medicine

John T. Milliken Department of Medicine, Washington University School of Medicine, Washington University, Saint Louis, Missouri

⁷Division of Pulmonary and Critical Care Medicine

Hospital del Mar–IMIM, Departament de Ciències Experimentals i de la Salut (CEXS], Universitat Pompeu Fabra, Barcelona, Catalunya Spain

⁸Servei de Pneumologia

Amsterdam UMC Location AMC, Amsterdam, The Netherlands

⁹Department of Intensive Care & Laboratory of Experimental Intensive Care and Anaesthesiology (L·E·I·C·A]

Hospital Israelita Albert Einstein, São Paulo, Brazil

¹⁰Department of Critical Care Medicine

Monash University, Melbourne, Australia

¹¹Australian and New Zealand Intensive Care Research Centre (ANZIC-RC]

Austin Hospital and University of Melbourne, Melbourne, Australia

¹²Data Analytics Research and Evaluation (DARE] Centre

Oxford University, Oxford, UK

¹³Nuffield Department of Medicine

Corporacion Sanitaria Universitaria Parc Taulí, Sabadell, Spain

¹⁴Critical Care Center

Mahidol University, Bangkok, Thailand

¹⁵Mahidol-Oxford Tropical Medicine Research Unit (MORU]

Corresponding author:

Luis Morales–Quinteros
Intensive Care Unit
Hospital Universitari Sant Pau
Carrer de Sant Quintí, 89
08041 Barcelona, Spain
Email: lmoralesq@santpau.cat

Table 1 Suppl. Univariate logistic regression analyses for variables associated with intubation and independent predictors of intubation determined by multivariable logistic regression analyses including variables before prone position and including variables at change from supine to prone position after 1 hour

Variable	Univariate			Multivariable ^a		
	OR	95%CI	P-value	OR	95%CI	P-value
Model using patients and baseline characteristics						
Male sex	1.55	0.60 to 4.00	0.364	-	-	-
Age (+1 years old) ^c	0.98	0.95 to 1.01	0.155	-	-	-
BMI (+1 kg/m ²) ^c	1.01	0.93 to 1.10	0.732	-	-	-
Respiratory rate > 26 breaths/min ^d	10.1 9	3.75 to 27.71	<0.001	6.8 2	1.96 to 23.72	0.003
PaO ₂ /FiO ₂ <120 ^{de}	20.3 4	6.79 to 60.98	<0.001	-	-	-
SpO ₂ /FiO ₂ <147 ^d	16.8 1	5.70 to 49.58	<0.001	18. 28	5.08 to 65.80	<0.001
PaO ₂ <100 mmHg ^d	17.9	1.09 to 23.22	0.039	10. 79	1.59 to 73.36	0.015
ROX Index ≥5.10 ^{de}	2	6.08 to 52.06	<0.001	-	-	-
Model using responses to awake prone positioning						
Male sex	1.55	0.60 to 4.00	0.364	-	-	-
Age (+1 years old) ^c	0.98	0.95 to 1.01	0.155	-	-	-
BMI (+1 kg/m ²) ^c	1.01	0.93 to 1.10	0.732	-	-	-
Respiratory rate > 2 breaths/min ^d	3.03	1.22 to 7.48	0.016	3.5 7 5.1	1.34 to 9.50 1.41 to	0.011
PaO ₂ /FiO ₂ <116 ^d	2.50	0.77 to 8.10	0.127	1	18.51	0.013
SpO ₂ /FiO ₂ <10 ^d	1.97	0.77 to 5.05	0.159	-	-	-

Table 1 Suppl. Univariate logistic regression analyses for variables associated with intubation and independent predictors of intubation determined by multivariable logistic regression analyses including variables before prone position and including variables at change from supine to prone position after 1 hour

Variable	Univariate			Multivariable ^a		
	OR	95%CI	P-value	OR	95%CI	P-value
				3.6	1.20 to	
PaO ₂ ≤ 10 mmHg ^d	2.71	0.98 to 7.49	0.054	0	10.78	0.022
ROX Index <1.84 ^d	1.67	0.67 to 4.17	0.276	-	-	-

OR indicates odds ratio; CI, confidence interval; BMI, body mass index.

Data are shown as estimated ORs (95%CI) of the explanatory variables in the intubation group. The OR represents the odds that intubation will occur given exposure of the explanatory variable, compared to the odds of the outcome occurring in the presence of that exposure. The P-values are based on the null hypothesis that all ORs relating to an explanatory variable equal unity (no effect). a Model including variables before prone position: Hosmer–Lemeshow goodness-of-fit test, P = 0.392; Area under the ROC curve, AUC = 0.89 (95%CI 0.81-0.97). Model including variables at change from supine to prone position after 1 hour: Hosmer–Lemeshow goodness-of-fit test, P = 0.515; Area under the ROC curve, AUC = 0.73 (95%CI 0.62-0.84). c +1 means a one-unit increase on the scale in the predictor variable (i.e., going from 1 to 2, 2 to 3, etc.). d Cut-off value obtained from ROC curve. e Excluded from the multivariable model due highly correlation with another variable. Data are n [%] or median [IQR]. P-values obtained from the Mann-Whitney test: no intubation vs. intubation

LEGEND FIGURE 1 SUPPLEMENT

Cumulative frequency distribution of the study variables mean blood pressure, heart rate, pH, HCO₃, lactate, and flow rate of the device used. The plots show the study parameters at baseline and 1 h after awake prone position of intubated and nonintubated patients. Line in red are intubated patients at 1 hour of awake proning; dotted line in red are intubated patients before awake proning; line in green are nonintubated patients at 1 hour of awake proning; dotted line in green are nonintubated patients before awake proning.

FIGURE 1 SUPPL.

