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## Letter to the Editor

### High-flow nasal cannulas in COVID-19 pneumonia



#### Cánulas nasales de alto flujo en la neumonía por COVID-19

Dear Editor:

After reading with special interest García-Pereña et al.'s article,<sup>1</sup> available online in your journal, we would like to share some reflections and comments.

The authors assume in their paper that non-intubated patients presenting with an SpO<sub>2</sub>/FiO<sub>2</sub> ratio ≤100 have a severe acute respiratory distress syndrome (ARDS). It is important to point out that unless these patients were breathing ambient air, FiO<sub>2</sub> ranges can vary by more than 10% depending on the device used (nasal tubes, Ventimask or Multi-vent mask).<sup>2</sup> Along these lines, based on Todd et al.'s work,<sup>3</sup> the relationship between SpO<sub>2</sub>/FiO<sub>2</sub> and PaO<sub>2</sub>/FiO<sub>2</sub> is known to be described based on the following equation: SpO<sub>2</sub>/FiO<sub>2</sub> = 64 + 0.84 × (PaO<sub>2</sub>/FiO<sub>2</sub>) (*p* < 0.0001; *r* = 0.89). Threshold SpO<sub>2</sub>/FiO<sub>2</sub> ratio values of 235 and 315 yielded a sensitivity of 85% with a specificity of 85% and a sensitivity of 91% with a specificity of 56%, respectively, for PaO<sub>2</sub>/FiO<sub>2</sub> ratios of 200 and 300.

Although the current Berlin definition might be deficient for reaching a diagnosis of ARDS, some authors believe that the development and application of standards to define disease processes improves the quality of medical care. Failure to do so could lead to interpretation errors that could have ominous implications for clinical practice.

In fact, an imprudent (time-dependent) use of non-invasive support systems may result in delayed endotracheal intubation and a worse clinical outcome. The presence of a pulmonary lesion causes the distribution of inspiratory forces through the lung tissue to be heterogeneous. An intense inspiratory effort interacts with the solid behavior of the injured lung, thus generating a vertical gradient in the regional transpulmonary pressure. This occurs mainly at the onset of inspiration and may shift pulmonary gas from the non-dependent, anterior lung regions to the dependent posterior regions, a phenomenon known as Pendelluft that causes additional regional overstretching in the dependent lung regions. Finally, it causes an increase in transmural pulmonary capillary pressure and facilitates transvascular fluid leakage, which further aggravates the interstitial and alveolar edema. These mechanisms might lead to spontaneous breathing resulting in a patient self-inflicted lung injury (P-SILI).<sup>4</sup>

Secondly, in addition to their failure to describe the statistical analysis carried out, we found a lack of variables of great interest in these patients in the comparative section. For example, based on the work published by Liu et al., we believe that variables such as the age, number of comorbidities, ROX index, Glasgow Coma Scale Score, and use of vasopressors on the first day of the high-flow nasal cannula (HFNC) therapy, all of which are independent risk factors for HFNC therapy failure in a multivariate regression,<sup>5</sup> cannot be ignored in this type of study.

Finally, we would like to emphasize that another plausible interpretation, considering the data presented by García-Pereña et al.,<sup>1</sup> is the fact that delayed intubation in these patients increases mortality in this cohort, with the likelihood of this statement being false being only 6.1% (*p* = 0.0061).

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