



## LETTER TO THE EDITOR

### Use of the ROX index in the assessment of success of high-flow oxygen therapy in secondary hypoxemia to type 2 coronavirus<sup>☆</sup>



### Utilización del índice de ROX en la valoración del éxito de oxigenoterapia de alto flujo en la hipoxemia secundaria a coronavirus tipo 2

Dear Editor:

High-flow nasal cannula (HFNC) provide high-flow oxygen—up to 60L/min—with FiO<sub>2</sub> between 0.21 and 1. The potential benefits would be: improved respiratory pattern with a lower respiratory rate (RR).

One variable suggested to assess success or failure is the ROX index (ROXI) that combines oxygenation (SpO<sub>2</sub>/FiO<sub>2</sub> ratio) and respiratory effort (RE). Its validity in the management of COVID-19-related pneumonia has a high sensitivity to predict failed therapies,<sup>1</sup> and is associated with a high mortality rate (45.4%).<sup>2</sup>

Regarding the denominator (RE) in the assessment of the ROXI, the retrograde, transcriptional, and hematogenous neuronal dissemination have been reported as possible access routes used by SARS-CoV-2 to enter the central nervous system. As a matter of fact, respiratory and cardiovascular vital centers of the brainstem are potential targets for SARS-CoV-2.<sup>3</sup> Sensitivity changes to peripheral chemoreceptors of carotid bodies invaded by SARS-CoV-2 can lead to a disproportionate ventilatory response at hypoxia level. Hyperexcitability can be developed in some cases and desensitization in others. Therefore, changes to the RE during the use of HFNC may not be associated directly with respiratory effort.<sup>4</sup>

During atypical acute respiratory distress syndrome (ARDS) due to SARS-CoV-2, patients often show a relatively well-preserved pulmonary mechanism that is not consistent with the severity of hypoxemia. To this point, several mechanisms converge: dysregulated pulmonary perfusion and hypoxic vasoconstriction, “infectious toxic encephalopathy” (central hypoxia), and damage to the carotid body<sup>5</sup> that could also be a route of infection into the nervous system.

We believe that we should be cautious when using the ROX index only as a predictor of success or failure in these patients.

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None reported.

### Conflicts of interest

None whatsoever.

### References

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