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The need for rigorous analysis of the effectiveness and efficiency of high flow oxygen therapy during the SARS-CoV-2 pandemic[☆]



La necesidad de un análisis riguroso de la efectividad y eficiencia de la terapia de oxígeno de alto flujo durante la pandemia por SARS-CoV-2

Dear Editor:

We wish to take the opportunity the editor of this journal gives us to make a few remarks on the response¹ given to the scientific letter “High-flow oxygen therapy in the treatment of SARS-CoV-2 pneumonia”.²

In the first place, in our analysis, and in the context of hypoxemic acute respiratory failure due to SARS-CoV-2-induced pneumonia, “the optimal decision was the use of the high-flow nasal cannula (HFNC) strategy followed by invasive mechanical ventilation (IMV) in cases of failed HFNC”. Our letter says it clearly, and we believe that the chances that this strategy is more effective compared to the control one are 0.965. However, this difference was not statistically significant, which is why with our we could not rule out the null hypothesis. Contrary to what the authors say in their response to our letter we could not confirm “(...) that high-flow oxygen therapy is not an effective therapy in clinical terms”, because this would have been like saying that the hypothesis is null, and our study was not statistically powered to determine such a thing.

Secondly, the authors of the comments to our letter indicate that our second conclusion is that the HFNC also is not cost-effective either (sic). We believe they are referring to the fact that, in our analysis, we claim that HFNC does not seem an effective therapy because the “incremental

cost-effectiveness ratio (ICER) is €219,294 for every discharge from the intensive care unit (ICU)”. And please let us stand by this conclusion, and on the fact that it seems necessary to perform a more solid analysis to confirm the economic impact of such strategy in terms of cost-effectiveness.

We do not think these statements contradict the scientific evidence collected in the metanalysis conducted by Agarwal et al.³ In this metanalysis, HFNC is compared to conventional oxygen therapy. Also, the results obtained in the most rigorous analysis (the one with fewer chances of bias) only found (like we did) a statistically non-significant difference (RR, 0.87; 95%CI, 0.75–1.01; $P = .06$; heterogeneity: $P = .84$). Using a beta-binomial conjugate Bayesian model from a non-informative aprioristic distribution in addition to the data provided by the authors’ table we can estimate (with a 95% credibility) that, according to the scientific literature on this issue, the chances of HFNC failure are somewhere between 0.422 and 0.533 (median, 0.477). Nearly the same chances we have when we toss a coin into the air, but with all the cost derived from treatment.

Funding

None whatsoever.

Conflicts of interest

The authors declared no conflicts of interest whatsoever.

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[☆] Please cite this article as: González-Castro A, Medina A, Modesto i Alapont V, Cuenca-Fito E, Fernandez-Rodríguez A, Peñasco Y. La necesidad de un análisis riguroso de la efectividad y eficiencia de la terapia de oxígeno de alto flujo durante la pandemia por SARS-CoV-2. *Med Intensiva*. 2021;45:508–509.

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