Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

The science of truth

La ciencia de la verdad

Dear Editor,

We have read the article ''*High flow nasal cannula useful for severe SARS-CoV-2 pneumonia*''[1] and we believe that what the authors claim is not supported by the data and analysis they provide. The article describes the use of HFNO with an initial requirement of 100% FiO_2. These are therefore patients with severe ARDS, which clinical practice guidelines prescribes intubation, invasive mechanical ventilation (IMV) and even prone position.[2] Maintaining non-invasive support in these patients causes more mortality than performing IMV.[3] This simple statement has not yet been able to be experimentally refuted.

Being a retrospective study, the cause–effect relationship regarding the efficacy of a treatment (HFNO) vs. another (IMV) cannot be rigorously argued if it is not demonstrated that the two cohorts (with and without treatment) were similar before applying the respective treatments. The authors do not present a table showing the distribution of the covariates in both cohorts before the treatment was applied. And therefore, we do not know the confounding factors that should have been controlled for in the analysis.

We did find some data that makes us believe that IMV was applied to patients with a higher probability of dying. Thus, they indicate that ''*patients were placed in HFNO if they had ventilatory failure*'', but that ''*patients that had severely altered consciousness at admission, severe work of breathing (exhaustion), or shock were placed on invasive mechanical ventilation*''. Survival of ($n = 30$) patients who received IMV was 42.2%. And of those ($n = 60$) who received HFNO at some point in their evolution, 35 (58%) could be weaned from HFNO and went home, but in 25 (42%) of them the treatment failed. Of these, 24 had to be intubated and 13 finally died (21.67% mortality).

The patients where HFNO failed (Tables 1 and 2) were much more severe than those where it worked. So, since the assignment of patients to treatments was not random, it is logical to deduce that the IMV had to deal with the most seriously ill. This is clearly a co-intervention bias. And despite this, we can calculate that the IMV was quite effective, in the sense of achieving the objective for which it was administered. Since IMV was applied to $30 + 24 = 54$ patients, with a total of $17 + 13 = 30$ deaths, it worked in more than 55.56% of the patients where it was applied. HFNO only fulfilled its function in 58% of the patients where it was used, and who were the healthiest. Using a beta-binomial Bayesian model, and a non-informative a priori distribution, the probability (rational belief) that IMV fulfills its function better than HFNO is 61.8%.

So, to our knowledge, statements such as ''We show evidence of the utility of HFNO in severe covid-19 patients that required ICU admission for the treatment of severe respiratory failure. We achieved a high survival and posterior discharge rate'' are far from having endured a rigorous experimental rebuttal and must still remain in the degree of belief.

Ethics approval and consent to participate

Consent for publication, availability of data and material: Not applicable.

Authors' contribution

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Conflict of interest

The authors declare no competing interest.

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