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## LETTER TO THE EDITOR RESPONSE

# Response to "Early prediction of noninvasive ventilation failure in COPD patients: derivation, internal validation, and external validation of a simple risk score"

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Dear editor,

We appreciate the letter by Ennouri et al. [1] and have read it with great interest. Five variables were used to develop the risk score (heart rate, acidosis, consciousness, oxygenation, and respiratory rate [HACOR]) to predict NIV failure in patients with chronic obstructive pulmonary disease (COPD) [2]. These variables were classified into clinically meaningful categories. We did not use one cutoff for each element to develop this risk score as some important information may be omitted. For example, if the 7.35 is a cutoff value for pH, the risk for NIV failure was the same in patients with pH of 7.30 and 7.10. Obviously, it was largely different between the two patients in real word. In addition, many risk scores (e.g., APACHE II) also used multiple cutoff variables to indicate different risk. Therefore, we believe multiple cutoff variables are better than one.

Taking into account the HACOR score variability from initiation to the other, the area under the receiver operating characteristic curves (AUC) was 0.85 for HACOR score at initiation and 0.74 for variability from initiation to 2 h of NIV (Fig. 1). It means the variability is less accurate than the actual value to predict NIV failure. Similar outcomes were confirmed at 12 and 24 h of NIV. These results tell us that the actual value is better than the variability to predict NIV failure. For example, if the HACOR score is 2 points at initiation of NIV, the risk for NIV failure is low. After 2 h of NIV, when it increases to 4 points, the absolute risk for NIV failure is still low. However, even the score decreases from 15 at initiation to 10 at 2 h of NIV, and the risk for NIV failure remains high. Therefore, we believe the actual value may be more accurate to predict NIV failure than variability.

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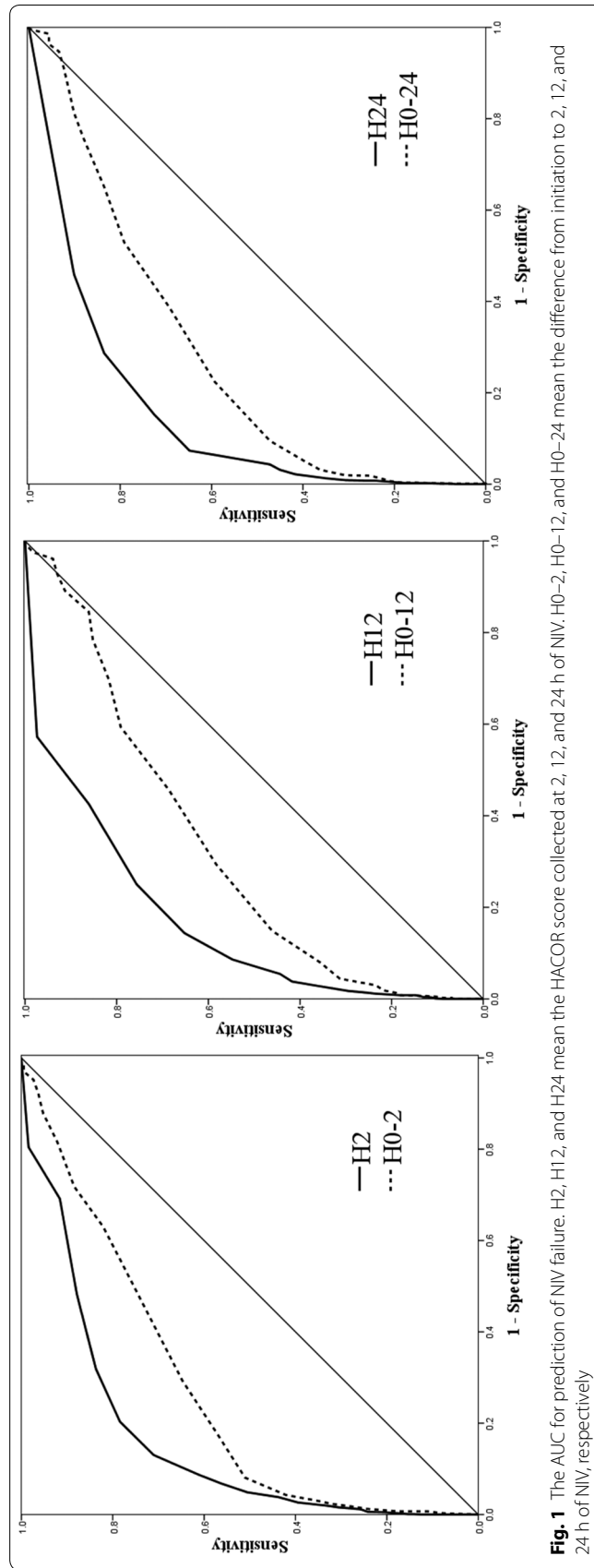
**Fig. 1** The AUC for prediction of NIV failure. H2, H12, and H24 mean the HACOR score collected at 2, 12, and 24 h of NIV. H0−2, H0−12, and H0−24 mean the difference from initiation to 2, 12, and 24 h of NIV, respectively

## Authors' contributions
JD conceived the response to the editor. JD and LB prepared the manuscript and revised the final version. Both authors read and approved the final manuscript.

## Availability of data and materials
The datasets analyzed during the current study are available from the corresponding author on reasonable request.

## Ethics approval and consent to participate
The Institutional Review Board of the First Affiliated Hospital of Chongqing Medical University approved the study. Informed consent was obtained from patients or their family members.

## Consent for publication
All authors have reviewed and approved the manuscript for publication.

## Competing interests
The authors declare that they have no competing interests.

## References
1. Ennouri E, Meddeb K, Toumi R, Boussarsar M, et al. Letter on "Early prediction of non invasive ventilation failure in COPD patients: derivation, internal validation, and external validation of a simple risk score". Ann Intensive Care. 2019. https://doi.org/10.1186/s13613-019-0613-9.
2. Duan J, Wang S, Liu P, Han X, Tian Y, Gao F, et al. Early prediction of noninvasive ventilation failure in COPD patients: derivation, internal validation, and external validation of a simple risk score. Ann Intensive Care. 2019;9(1):108.

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