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.

Anaesth Crit Care Pain Med 39 (2020) 577–578

ELSEVIER

SFAR
Société Française d'Anesthésie et de Réanimation

Letter to the Editor

No added value of the modified NEWS score to predict clinical deterioration in COVID-19 patients

ARTICLE INFO

Keywords:
ARDS
COVID-19
News Score
Intensive care Unit

Dear Editor,

The current international outbreak of COVID-19 respiratory illness due to the SARS-CoV-2 virus results in high rates of hospitalisation and intensive care unit (ICU) admission [1]. ICU resources in Europe are limited [2], and managing ICU-bed flow is therefore vital to ensure high quality of care to all patients. The National Early Warning Score (NEWS) is recommended by the National Institute for Health and Care Excellence in its guidelines for predicting the risk of clinical deterioration of COVID-19 patients [3]. In this journal, Liao et al. [4] recently proposed a modified version of the NEWS score (mNEWS) for COVID-19 patients with age $\geq$65 years (score 3 points) added as an independent risk factor for survival. However, the authors did not provide data to support this modification and we did not identify published peer-reviewed research studies on it use to guide decision-making in COVID-19 patients. In this study, the performance of NEWS and mNEWS scores is examined to predict clinical deterioration and ICU admission in COVID-19 patients.

This retrospective study involved 363 adult patients with laboratory-confirmed infection of SARS-CoV-2 admitted to our institution, between March 10 and May 10, 2020. Using our institution database, NEWS and mNEWS values were collected throughout the ward admission. Clinical deterioration was defined as ICU admission or death. For statistical analysis, continuous measurements are presented as means $\pm$ SDs or as medians [IQRs], which compared with unpaired bilateral *t*-test or the Wilcoxon–Mann–Whitney test when appropriate. Categorical variables were expressed as numbers (%). Predictive performance of the NEWS and mNEWS scores was assessed using the area under the receiver operating characteristic (ROC_{AUC}) curve using the method described by DeLong et al. [5].

Over the study period, 416 adult COVID-19 patients were hospitalised and 53 patients with withholding or withdrawing life-support were excluded from the analysis. One hundred seventy-two patients presented a clinical deterioration (22 patients died and 150 were admitted to one of the 160 COVID-19 ICU beds) (Fig. 1A). Median delay to ICU transfer was 1 day [0–3]. NEWS and mNEWS scores values were significantly higher in the group with a clinical deterioration (Fig. 1B). Median age was not significantly different between patients with a clinical deterioration (65 years [55–75]) or without (64 years [54–76]). The performance, as quantified by the ROC_{AUC}, was not significantly different between the NEWS and mNEWS scores to predict clinical deterioration (ROC_{AUC} 0.74 [CI95, 0.69–0.78] *vs.* 0.72 [CI95, 0.67–0.77];

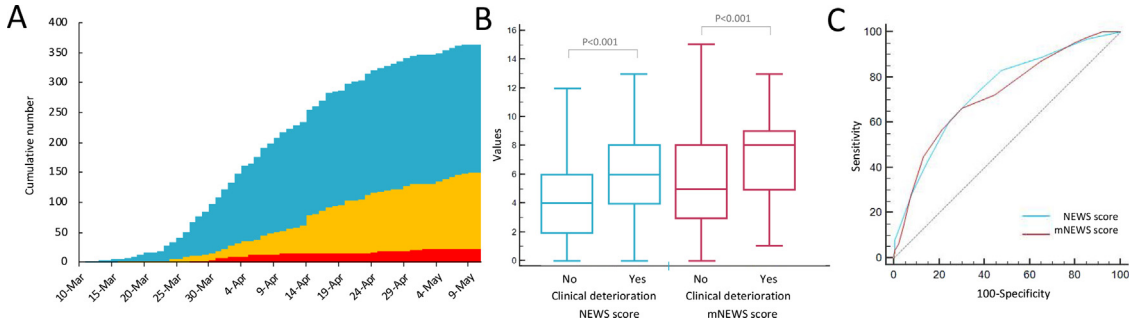

Fig. 1. A. Cumulative number over the study period of patients with laboratory-confirmed infection of SARS-CoV-2 admitted in COVID-19 units (blue), transferred in COVID-19 ICUs (yellow) or died in hospital general wards (red); B. Box plot of the NEWS score (blue) and modified NEWS score (mNEWS; red) [4] values according the occurrence or not of a clinical deterioration in COVID-19 patients; C. Receiver operating characteristic (ROC) curves of NEWS (blue) and mNEWS (red) scores to predict clinical deterioration in COVID-19 patients.

https://doi.org/10.1016/j.accpm.2020.07.008

$P = 0.274$; Fig. 1 C) or ICU admission (ROC_{AUC} 0.73 [CI95, 0.68–0.78] *vs.* 0.70 [CI95, 0.65- 0.75]; $P = 0.088$).

The NEWS score was not accurate ($ROC_{AUC} < 0.75$) to predict clinical deterioration in COVID-19 patients. This may be related to the specific respiratory failure outcome due to COVID-19. Moreover, the addition of the age as suggested by Liao et al. [4] in their modified version brings no added value in terms of performance.

Ethics approval and consent to participate

Patients and their relatives were informed of the possibility of the use of medical data for retrospective studies and did not manifest opposition. This study was approved by the local Ethics Commission (2020-53) and the French Society of Anaesthesia and Critical Care (00010254-2020-06).

Availability of data and material

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Funding

The authors receive no funding for this work.

Authors' contributions

J.B., D.T. and P.S. contributed to the conception and design of the study, had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. Y.B. and M.V. contributed to the acquisition of data. J.B., D.T. and P.S. contributed to the analysis and interpretation of the data. P.S. contributed to the statistical analyses. All authors participated in manuscript writing, revision and approval for final submission. Drs. Y.B and M.V contributed equally and shared first authorship.

Disclosure of interest

The authors declare that they have no competing interest.

Acknowledgements

We thank Prs. J. Albanese, N. Bruder, P. Chanez, M. Gainnier, J.R. Harle, M. Leone, L. Papazian, L. Velly and Drs. V. Blasco, J. Carvelli, J.M. Forel, C. Guidon, H. Max, V. Veit, L. Zieleskiewicz for collecting cases. And we gratefully acknowledge all the health care workers on the front line and all the patients involved in the study.

References

[1] Grasselli G, Zangrillo A, Zanella A, et al. Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy. JAMA 2020;323:1574–81. http://dx.doi.org/10.1001/jama.2020.5394.
[2] Rhodes A, Ferdinande P, Flaatten H, et al. The variability of critical care bed numbers in Europe. Intensive Care Med 2012;38:1647–53.
[3] https://www.nice.org.uk/guidance/ng159/resources/covid19-rapid-guideline-critical-care-in-adults-pdf-66141848681413.
[4] Liao X, Wang B, Kang Y. Novel coronavirus infection during the 2019-2020 epidemic: preparing intensive care units–the experience in Sichuan Province, China. Intensive Care Med 2020;46:357–60.
[5] DeLong ER, DeLong DM, Clarke-Pearson DL. Comparing the areas under two or more correlated receiver operating characteristic curves: a nonparametric approach. Biometrics 1988;44:837–45.

Maxime Volff[a], David Tonon[a], Jeremy Bourenne[b,*], Pierre Simeone[a,c], Lionel Velly[a,c]

[a]*Aix Marseille University, AP-HM, Department of Anaesthesiology and Critical Care Medicine, University Hospital Timone, Marseille, France*
[b]*Aix Marseille University, AP-HM, Emergency and Critical Care Medicine, University Hospital Timone, Marseille, France*
[c]*CNRS, Institut des neurosciences de la Timone, UMR 7289, Marseille, France*

[*]Corresponding author at: Réanimation des Urgences, Hôpital la Timone 2, 13005 Marseille, France
E-mail address: jeremy.bourenne@ap-hm.fr (J. Bourenne).

Available online 10 July 2020