Letter to Editor

A warning related to predicting the severity of COVID-19 pneumonia using the A-DROP scoring system

ARTICLE INFO

To the Editor'

The Japanese Respiratory Society (JRS) pneumonia guidelines proposed the predictive rules of the A-DROP scoring system for assessment of the severity of pneumonia: A; age over 70 years in men and over 75 years in women, D; dehydration, R; respiratory failure, O; orientation disturbance, and P; low blood pressure. Several studies have demonstrated that the A-DROP scoring system is useful for predicting mortality in patients with community-acquired pneumonia and nursing and healthcare-associated pneumonia [1–5]. In addition, Kohno et al. demonstrated that the mechanical ventilation rates in pneumonia patients with acute respiratory failure increased depending on the severity classified according to the A-DROP scoring system [6]. These results suggested that the A-DROP scoring system can predict not only mortality but also the requirement for mechanical ventilation.

Recently, Kodama et al. assessed the A-DROP scoring system for the prediction of an increase in oxygen requirement for patients with COVID-19 pneumonia [7]. The area under the curve for the ability of the A-DROP scoring system to predict an increase in oxygen requirement was 0.6980, which was significantly lower than the expanded CURB-65 scores [7]. This result indicated that the A-DROP scoring system, especially with scores indicating mild (score 0) to moderate pneumonia (score 1 or 2), may not be useful for predicting the requirement for mechanical ventilation in patients with COVID-19 pneumonia. We aimed to clarify whether the A-DROP scoring system can be accurately used for patients with mild to moderate COVID-19 pneumonia.

We assessed 823 patients with COVID-19 pneumonia (335 had lineage B.1.1.7) and 302 patients with bacterial pneumonia observed in five institutions between February 2020 and June 2021 [8]. Mild to moderate COVID-19 pneumonia at the first examination was observed in 435 patients in the non-B.1.1.7 group and 279 patients in the B.1.1.7 group [8]. Statistical analysis was performed using Stat View version 5.0. (SAS Institute Inc, Cary, NC, USA). The incidence of mechanical ventilation rate by pneumonia severity in patients with COVID-19 pneumonia and bacterial pneumonia was analyzed using Fisher's Exact test. No significant differences were observed in the mechanical ventilation rate between the non-B.1.1.7 group and B.1.1.7 group (Table 1). The mechanical ventilation rate was significantly higher in patients containing R factor than in patients in the R factor-free group in those with moderate COVID-19 pneumonia ($p<0.0001$) (Table 1). The mechanical ventilation rate in patients containing R factor was significantly higher for COVID-19 pneumonia (57.6% of patients with a score of 1 and 68.6% with a score of score 2) than bacterial pneumonia (4.3% with a score of 1 and 12.2% with a score of 2) (Table 1). In contrast, no significant differences were observed in the mechanical ventilation rate among the R-free factor groups (Table 1).

The A-DROP scoring system was accurate and clinically useful for assessment of the severity of both bacterial and atypical pneumonia [1–6]. A low score, indicating mild to moderate pneumonia, reflected a good prognosis such as low mechanical ventilation rate or low mortality rate. In contrast, a high score, indicating severe or extremely severe pneumonia, was associated with a high mechanical ventilation rate or high mortality rate. Our results demonstrated that a high mechanical ventilation rate was observed in spite of a low score in patients with COVID-19 pneumonia containing R factor. Thus, physicians should take care not to be misled by a low score from a pneumonia severity score containing R factor using the A-DROP scoring system in patients with COVID-19 pneumonia.

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Ethics statement

The study protocol was approved by the Ethics Committee of Kansai Medical University (approval number 2020319).

Declaration of competing interest

The authors declare that they have no conflicts of interest.

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Table 1

Mechanical ventilation rates by pneumonia severity in patients with COVID-19 pneumonia and bacterial pneumonia at the first examination.

| Pneumonia severity score[a] | Non-B.1.1.7 MV cases/ number (%) | COVID-19 pneumonia | | Bacterial pneumonia | p-value |
		B.1.1.7 MV cases/ number (%)	Total MV cases/ number (%)	MV cases/ number (%)	
0 point	3/197 (1.5)	0/57	3/254 (1.2)	0/31	>0.9999
1 point containing R factor	42/66 (63.6)	60/111 (54.1)	102/177 (57.6)	1/23 (4.3)	0.0006
1 point R-free factor	4/62 (6.5)	2/23 (8.7)	6/85 (7.1)	2/76 (2.6)	0.2892
2 points containing R factor	57/83 (68.7)	52/76 (68.4)	109/159 (68.6)	5/41 (12.2)	<0.0001
2 points R-free factor	2/27 (7.4)	2/12 (16.7)	4/39 (10.3)	7/81 (8.6)	0.7500

[a] The severity of pneumonia was evaluated using predictive rules via the A-DROP system proposed by the JRS guidelines. The incidence of mechanical ventilation rate by pneumonia severity in patients with COVID-19 pneumonia (total) and bacterial pneumonia was analyzed using Fisher's Exact test. R, respiratory failure. MV, mechanical ventilation.

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