MedEpicent
Journal of Medical Education and Clinical Research

Received: 6 May 2026
Revised: 11 June 2026
Accepted: 27 June 2026
Published: 28 June 2026

The role of baseline PaO2/FiO2, SpO2 and IL-6 indicators in predicting in-hospital mortality in ARDS patients: a retrospective cohort study

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DOI: *10.64288/6q482582*

Abstract *The aim of this study was to evaluate the role of baseline oxygenation parameters, including PaO2/FiO2 and SpO2, as well as the inflammatory marker IL-6, in predicting in-hospital mortality among patients treated in the intensive care unit with a diagnosis of acute respiratory distress syndrome (ARDS). Low baseline PaO2/FiO2 and SpO2 levels and elevated IL-6 values are strongly associated with in-hospital mortality in patients with ARDS. The combined use of oxygenation parameters and IL-6 may provide a simple, accessible, and clinically useful approach for early mortality risk stratification in intensive care settings.*

Keywords: ARDS; Mortality; PaO2/FiO2; Oxygen Saturation; Interleukin-6; Intensive Care Units

Vol. 2 No. 2 (2026)
Original Article
DOI:10.64288/6q482582
E-ISSN: 3106-4418

MedEpicent
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1. Introduction

Acute respiratory distress syndrome (ARDS) and severe viral pneumonias, especially those associated with COVID-19, are characterized by high mortality, and early risk assessment plays an important role in clinical decision-making [1]. Hypoxemia and systemic inflammatory response are considered the main pathophysiological mechanisms in the course of the disease, and these processes are closely associated with oxygenation indices and cytokine levels [2].

The PaO2/FiO2 ratio is one of the most widely used indicators in assessing the severity of ARDS, and low levels have been associated with high mortality [3]. Various studies have shown that the PaO2/FiO2 measured at admission is an independent prognostic factor for both short-term and 28-day mortality [4]. At the same time, dynamic changes in PaO2/FiO2 have also been associated with patient survival probability [5].

The SpO2/FiO2 ratio is a non-invasive indicator that can be used as an alternative to arterial blood gas analysis and shows a strong correlation with PaO2/FiO2 [6]. Studies have shown that SpO2/FiO2 is useful both in assessing disease severity and predicting mortality [7]. In addition, combining this parameter with other clinical scores further increases prognostic accuracy [8].

Among inflammatory biomarkers, interleukin-6 (IL-6) is of particular importance. Elevated IL-6 levels are associated with a "cytokine storm," which may lead to the development of ARDS and multi-organ failure [9]. Clinical studies have shown that high IL-6 levels are directly associated with an increased risk of mortality [10]. Furthermore, when IL-6 and PaO2/FiO2 are used together, higher accuracy in mortality prediction is achieved [11].

In modern approaches, constructing risk models using a combination of several biomarkers is considered more effective. For example, multivariable models including SpO2/FiO2, IL-6 and other laboratory indicators have demonstrated high discriminative ability [12]. At the same time, adding clinical factors such as age and comorbidities to these models further increases their prognostic value [13].

However, most existing studies have evaluated the role of individual biomarkers separately, while their combined use and application in specific populations have not been sufficiently studied. Therefore, comprehensive evaluation of the role of admission PaO2/FiO2, SpO2 and IL-6 in predicting mortality remains insufficiently investigated.

The aim of this study is to evaluate the relationship between baseline oxygenation indicators and inflammatory markers with mortality in ARDS patients and to investigate the construction of a prognostic model based on these parameters.

2. Methods

Vol. 2 No. 2 (2026)
Original Article
DOI:10.64288/6q482582
E-ISSN: 3106-4418

Received: 6 May 2026
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This study was conducted as a retrospective, single-center cohort study. The study was carried out based on the medical records of patients with acute respiratory distress syndrome (ARDS) who were treated in the intensive care unit of Baku Medical Plaza, Babek branch.

The main objective of the study was to evaluate the role of oxygenation parameters recorded during hospitalization and the level of IL-6, an inflammatory biomarker, in predicting in-hospital mortality in patients with ARDS. In this study, the effect of treatment was not evaluated; rather, the relationship between the patient's initial clinical-biological profile and the risk of death was investigated.

Patients aged 18 years and older who were treated in the intensive care unit with a diagnosis of ARDS were included in the study. The diagnosis of ARDS was determined based on the Berlin criteria. Only patients who had PaO2/FiO2, SpO2, and IL-6 parameters available during hospitalization were included in the analysis.

Inclusion criteria:

• being 18 years of age or older;
• presence of a diagnosis of ARDS;
• availability of initial PaO2/FiO2, SpO2, and IL-6 results;
• known in-hospital clinical outcome.

Exclusion criteria:

• patients younger than 18 years of age;
• absence of essential respiratory or laboratory parameters;
• incomplete information regarding clinical outcome;
• insufficient information in medical records for analysis.

All data were collected retrospectively from the patients' electronic and written medical records. The collected data included demographic parameters, clinical characteristics, comorbidities, respiratory parameters, laboratory results, and in-hospital outcome.

Demographic and clinical variables included age, sex, arterial hypertension, diabetes mellitus, chronic lung disease, smoking history, and length of stay in the intensive care unit.

The biomarkers and respiratory parameters selected for the main analysis were as follows:

• PaO2/FiO2 ratio;
• SpO2 parameter;
• SpO2/FiO2 ratio;
• IL-6 level.

PaO2/FiO2 was calculated as the ratio of the partial pressure of oxygen in arterial blood to the fraction of inspired oxygen. SpO2/FiO2 was calculated based on the ratio of peripheral oxygen saturation to FiO2. IL-6 level was recorded based on laboratory analysis results obtained during hospitalization.

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Only baseline parameters were used in this study. Serial changes and post-treatment dynamics were not included in the main analysis, because the purpose of the study was to assess the risk of death based on baseline clinical-biological parameters.

The primary endpoint of the study was defined as in-hospital mortality. Patients were divided into two groups according to final outcome:

• surviving patients;
• patients who died during hospitalization.

In the main analysis, the differences in baseline PaO2/FiO2, SpO2/FiO2, SpO2, and IL-6 parameters between these two groups were evaluated.

A prognostic model was constructed based on baseline oxygenation and inflammatory markers to assess mortality risk. Initially, PaO2/FiO2, SpO2/FiO2, and IL-6 parameters were included in the model. Later, the addition of clinical variables such as age, sex, and major comorbidities to the model was considered.

The purpose of the model was to divide patients into higher- and lower-risk groups in terms of risk of death. Therefore, both the prognostic power of individual biomarkers and that of the combined model were evaluated separately in the analysis.

Due to the retrospective design, some clinical and laboratory parameters may have been incomplete in certain patients. Patients without PaO2/FiO2, SpO2, and IL-6 parameters, which were essential for the main analysis, were excluded from the analysis. Missing data for other variables were recorded separately, and statistical analyses were performed based on available data.

Data imputation was not performed. This approach was chosen in accordance with the nature of the retrospective study.

Statistical analyses were performed using IBM SPSS Statistics version 29.0. The distribution of continuous variables was assessed using appropriate normality tests and visual methods. Non-normally distributed continuous variables were presented as median and interquartile range (Q1–Q3), while categorical variables were presented as number and percentage (%). Comparison of continuous variables between surviving and deceased patients was performed using the Mann–Whitney U test, and comparison of categorical variables was performed using the chi-square test or Fisher's exact test where appropriate.

To evaluate the relationship between baseline PaO2/FiO2, SpO2, and IL-6 parameters and in-hospital mortality, univariable logistic regression analysis was first performed. Clinically significant variables and variables with $p<0.10$ in the univariable analysis were included in the multivariable logistic regression model. PaO2/FiO2, SpO2, and IL-6 were included in the main prognostic analysis. Demographic characteristics and comorbidities, including age, sex, arterial hypertension, diabetes mellitus, chronic lung

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disease, and smoking status, were reviewed as part of the baseline clinical profile and considered in the clinical interpretation of the findings. Since IL-6 had a right-skewed distribution, it was used in log-transformed form in the analyses. Results were presented with odds ratio (OR), 95% confidence interval (CI), and p value.

The ability of prognostic parameters to discriminate mortality was evaluated by receiver operating characteristic (ROC) analysis. Area under the curve (AUC), optimal cut-off values, sensitivity, and specificity were calculated for PaO2/FiO2, SpO2, and IL-6. Optimal cut-off values were determined based on the Youden index. In addition, a combined prognostic model including PaO2/FiO2, SpO2, and IL-6 together was constructed, and its discrimination ability was compared with individual parameters. Model discrimination was evaluated using ROC analysis and AUC values. Because of the retrospective single-center design and limited sample size, formal calibration analysis and external validation were not performed. Therefore, the combined model was interpreted mainly according to its discrimination performance, and future studies should assess calibration using methods such as the Hosmer–Lemeshow goodness-of-fit test and calibration plots.

This study was conducted based on the retrospective analysis of medical data of patients treated at Baku Medical Plaza, Babek branch. The study protocol was approved by the Medical Plaza Ethics Committee (Protocol number: BMP-06-2025; approval date: 18 June 2025). The study was carried out in accordance with the principles of the Declaration of Helsinki. Due to the retrospective design, individual written consent was not obtained from the patients; all data were anonymized and patient confidentiality was protected.

3. Results

A total of 97 ARDS patients with complete baseline PaO2/FiO2, SpO2, and IL-6 parameters were included in the study. Of the patients, 58 survived, while 39 died during hospitalization. Overall in-hospital mortality was 40.2%. Marked differences were observed between surviving and deceased patients in terms of baseline oxygenation parameters and inflammatory marker levels.

PaO2/FiO2 was significantly lower in deceased patients compared with surviving patients. While the median PaO2/FiO2 in survivors was 180.0 (165.0–190.0), this parameter was 128.0 (107.0–140.0) in deceased patients, and the difference was statistically significant ($p<0.001$). This result shows that the risk of death is higher in patients with more severe oxygenation impairment at baseline.

The SpO2 parameter changed in a similar direction. The median baseline SpO2 was 88.0% (87.0–90.0) in surviving patients and 81.0% (80.0–82.5) in deceased patients. The difference between the groups was statistically significant ($p<0.001$). This result shows that SpO2, a simple and non-invasive

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parameter, may also be useful in initial risk assessment in patients with ARDS.

IL-6 levels were higher in deceased patients. The median IL-6 was determined as 936.5 (861.5–959.5) in survivors and 1025.0 (965.0–1082.0) in deceased patients ($p<0.001$). This result shows that a high systemic inflammatory response is associated with in-hospital mortality.

The duration of intensive care was longer in surviving patients. The median duration of intensive care was 14.0 days (11.0–16.0) in survivors and 9.0 days (6.0–13.5) in deceased patients ($p<0.001$). This difference may indicate that clinical deterioration occurred earlier in deceased patients.

The comparison of baseline clinical-laboratory parameters between surviving and deceased patients is presented in Table 1, and the visual distribution of these parameters by groups is presented in Figure 2.

Figure 2. Comparison of baseline parameters in surviving and deceased patients.

Baseline PaO2/FiO2, SpO2, and IL-6 parameters were compared between surviving and deceased patients and are presented in Figure 2.

In logistic regression analysis, PaO2/FiO2, SpO2, and IL-6 parameters showed a statistically significant association with in-hospital mortality. Each 10-unit increase in PaO2/FiO2 was associated with a decrease in the probability of death (OR=0.35; 95% CI: 0.23–0.53; $p<0.001$). Each 1% increase in SpO2 was also associated with a decrease in mortality risk (OR=0.57; 95% CI: 0.47–0.69; $p<0.001$). Conversely, each 100-unit increase in IL-6 level increased the probability of death (OR=10.92; 95% CI: 3.96–30.16; $p<0.001$).

In multivariable analysis, when PaO2/FiO2 and IL-6 were evaluated together, both parameters retained their association with mortality. Each 10-unit increase in PaO2/FiO2 reduced the risk of death (OR=0.41; 95% CI: 0.27–0.63; $p<0.001$), while each 100-unit increase in IL-6 increased the risk of death (OR=4.02; 95% CI: 1.30–12.37; $p=0.015$). When SpO2 was added to the model, the overall prognostic performance of the combined model increased, although the independent effect of SpO2 was at the borderline level of significance ($p=0.071$). This may be explained by the close clinical relationship between SpO2 and PaO2/FiO2 parameters.

The results of logistic regression and ROC analysis for variables associated with mortality are shown in Table 2.

In ROC analysis, the highest discrimination ability among individual parameters was observed for PaO2/FiO2 (AUC=0.944). The AUC was 0.911 for SpO2 and 0.868 for IL-6. The optimal cut-off was determined as ≤150 for PaO2/FiO2, ≤86% for SpO2, and ≥976 for IL-6. In the combined model, when PaO2/FiO2 and IL-6 were used together, the AUC was 0.951. When PaO2/FiO2, SpO2, and IL-6 were included in the model together,

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the AUC increased to 0.962. This result shows that the combined biomarker approach provides higher prognostic accuracy compared with individual parameters.

The ability of PaO2/FiO2, SpO2, IL-6, and the combined model to discriminate mortality is presented in Figure 1, and the distribution of the probability of death calculated based on the combined model among surviving and deceased patients is presented in Figure 3.

Table 1. Comparison of baseline parameters between survivors and non-survivors

Parameter	*Survivors (n=58)*	*Non-survivors (n=39)*	*p value*
PaO2/FiO2	180.0 (165.0–190.0)	128.0 (107.0–140.0)	<0.001
SpO2, %	88.0 (87.0–90.0)	81.0 (80.0–82.5)	<0.001
IL-6	936.5 (861.5–959.5)	1025.0 (965.0–1082.0)	<0.001
ICU stay, days	14.0 (11.0–16.0)	9.0 (6.0–13.5)	<0.001

Table 2. Construction of the prognostic model and mortality-associated variables

Model / variable	*OR*	*95% CI*	*p value*	*AUC*	*Optimal cut-off*	*Sensitivity*	*Specificity*
PaO2/FiO2, per 10-unit increase	0.35	0.23–0.53	<0.001	0.944	≤150	87.2%	94.8%
SpO2, per 1% increase	0.57	0.47–0.69	<0.001	0.911	≤86%	92.3%	84.5%
IL-6, per 100-unit increase	10.92	3.96–30.16	<0.001	0.8668	≥976	69.2%	91.4%
PaO2/FiO2 + IL-6 model	—	—	<0.001	0.951	—	87.2%	98.3%
PaO2/FiO2	—	—	<0.001	0.9	—	87.2%	98.3%

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+ SpO2 + IL-6 model	6 2

Figure 1. ROC curves for mortality prediction.
The ability of PaO2/FiO2, SpO2, IL-6, and the combined model to discriminate mortality was evaluated using ROC analysis and is presented in Figure 1.

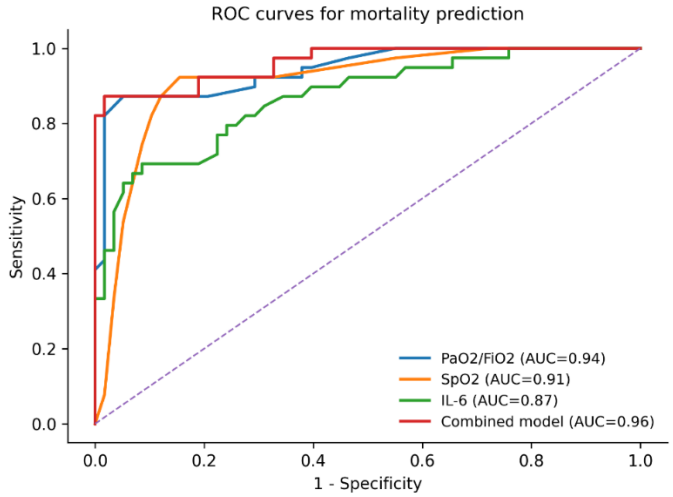

Figure 1.

Figure 2. Comparison of baseline parameters between survivors and non-survivors.
Baseline PaO2/FiO2, SpO2, and IL-6 values were compared between survivors and non-survivors and are presented in Figure 2.

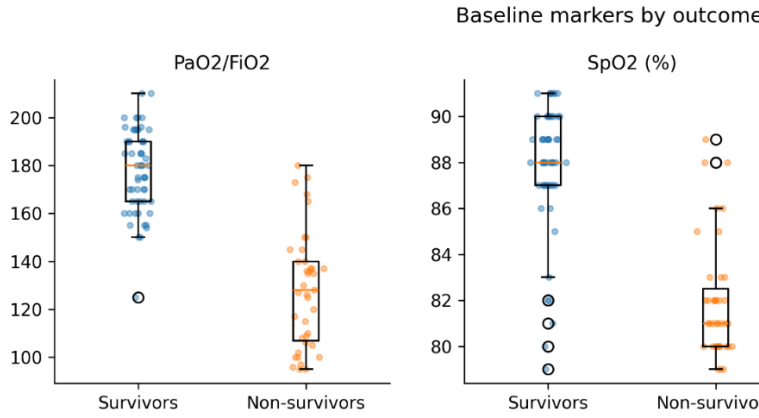

Figure 2.

Figure 3. Distribution of predicted mortality probability based on the combined model.
The predicted probability of death calculated using the combined model was higher among non-survivors, and this distribution is shown in Figure 3.

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DOI:10.64288/6q482582
E-ISSN: 3106-4418

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Accepted: 27 June 2026
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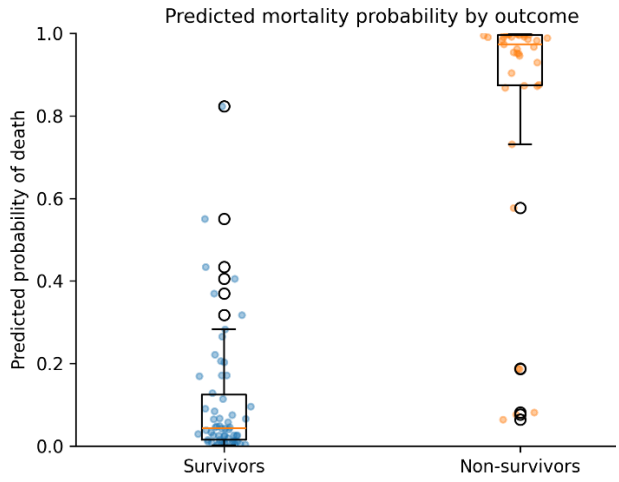

Figure 3.

4. Discussion

The results of this study showed that baseline oxygenation parameters and systemic inflammatory markers play an important role in predicting in-hospital mortality in patients treated in intensive care with a diagnosis of ARDS. In particular, low PaO2/FiO2 ratio, decreased SpO2 level, and elevated IL-6 parameter demonstrated a strong and statistically significant association with the risk of death. These results once again confirm that the pathophysiology of ARDS is closely related to both hypoxemia and hyperinflammatory response and highlight the importance of early-stage risk stratification in clinical practice.

The PaO2/FiO2 ratio is one of the most widely used parameters for assessing the severity of ARDS and also provides important information about the prognosis of the disease. Previous studies have shown that low PaO2/FiO2 reflects not only the degree of respiratory failure, but also systemic disease burden and the risk of multiorgan dysfunction, and consequently is associated with increased mortality [14,15]. Our results also support this concept and showed that PaO2/FiO2 acts as an independent prognostic factor. In this regard, a low value of this parameter during initial assessment may serve as a basis for planning more aggressive and early interventions in clinical decision-making.

The role of SpO2 is particularly noteworthy from a practical perspective, because this parameter is non-invasive, rapid, and widely accessible. Previous studies have shown that saturation-based indices such as SpO2/FiO2 can be used as an alternative to arterial blood gas analyses and provide sufficiently high accuracy in predicting mortality [16]. In our study as well, low SpO2 level was significantly associated with the risk of death, indicating that even simple monitoring parameters can have high clinical value when interpreted correctly. Especially in resource-limited settings, SpO2-based assessment may serve as an effective and practical method of risk stratification.

The role of inflammatory processes in ARDS has been widely investigated in recent years, and IL-6 is considered one of the central mediators of these processes. Elevated IL-6

Vol. 2 No. 2 (2026)
Original Article
DOI:10.64288/6q482582
E-ISSN: 3106-4418

Received: 6 May 2026
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Accepted: 27 June 2026
Published: 28 June 2026

level, one of the main components of the cytokine storm phenomenon, has been associated with severe clinical course, multiorgan failure, and high mortality [17,18]. Our results also confirmed previous data in this direction and showed that high IL-6 level is independently associated with an increased risk of death. This emphasizes the importance of IL-6 not only as a diagnostic but also as a prognostic marker and suggests that it may potentially play a role in the selection of targeted treatment strategies.

One of the important findings of this study is that the combined assessment of oxygenation parameters and inflammatory markers provides higher prognostic accuracy. Previous studies have shown that, compared with models based on a single biomarker, multicomponent models allow patients to be divided more accurately into risk groups and guide clinical decision-making more precisely [19]. The increase in AUC in our combined model also clearly demonstrated the superiority of this approach. This shows that in complex and heterogeneous syndromes such as ARDS, a multidimensional approach is more appropriate.

The heterogeneity of ARDS and the presence of different clinical phenotypes also play an important role in interpreting the results. Studies have shown that patients with a hyperinflammatory phenotype have both higher levels of inflammatory markers and a significantly increased risk of mortality [20]. In this regard, the assessment of biomarkers such as IL-6 may help determine not only the current condition but also the phenotype to which the patient belongs, which is important for the application of personalized treatment approaches.

At the same time, mortality in ARDS is not limited only to oxygenation and inflammation, and other systemic factors also influence this process. Various studies have shown that high levels of parameters such as D-dimer, CRP, ferritin, and NLR are associated with poor clinical outcomes [21]. This once again shows that ARDS is a multifactorial pathological process and requires a complex approach for its prediction. In this context, the parameters selected in our study constitute an optimal balance in terms of both clinical accessibility and prognostic significance.

Another important point is the prognostic significance of changes in oxygenation parameters over time. Previous studies have shown that worsening of PaO2/FiO2 and other oxygenation indices during the course of the disease is closely associated with mortality, and changes observed particularly in the first days may provide critical prognostic information [22]. This indicates that not only baseline parameters, but also their dynamic monitoring should be taken into account in clinical decision-making.

At the same time, the patient's age and comorbid conditions are also important determinants affecting outcomes. Previous studies have shown that increasing age and the presence of concomitant diseases significantly increase mortality risk [23].

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Original Article
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E-ISSN: 3106-4418

Received: 6 May 2026
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Evaluation of these factors together with biomarkers allows the construction of more accurate and clinically useful prognostic models.

Some limitations of this study should be considered. Due to the retrospective design, completeness of data and selection bias cannot be excluded, and the single-center nature of the study may limit the generalizability of the results. In addition, evaluation of only baseline parameters does not allow reflection of the time-varying effects of biomarkers. In the future, conducting larger and prospective studies is important to confirm and expand these results.

Nevertheless, the main strength of the study is that it presents an effective and applicable prognostic approach based on parameters easily obtained in daily clinical practice. This approach may be particularly important in intensive care settings for early risk stratification, optimal allocation of resources, and selection of personalized treatment strategies.

5. Conclusion

This study showed that PaO2/FiO2, SpO2, and IL-6 parameters measured during hospitalization in ARDS patients have important prognostic significance in the assessment of in-hospital mortality. Low PaO2/FiO2 and SpO2 levels reflected more severe oxygenation impairment, while high IL-6 level reflected a stronger systemic inflammatory response and was significantly associated with the risk of death.

Among individual parameters, PaO2/FiO2 showed the highest prognostic performance; however, combining oxygenation parameters with IL-6 further increased the discrimination ability of the model. This result shows that mortality in ARDS is determined not only by hypoxemia, but also by the intensity of the systemic inflammatory response.

Thus, a combined approach based on PaO2/FiO2, SpO2, and IL-6 parameters may be a simple, accessible, and clinically useful tool for early risk stratification in ARDS patients. This model may help in the early identification of high-risk patients in intensive care, strengthening of monitoring, and individualization of treatment strategy. In the future, confirmation of these results through larger, multicenter, and prospective studies would be appropriate.

Declarations

Ethical approval and consent to participate

The study protocol was approved by the Ethics Committee of Baku Medical Plaza Medical Center (Protocol number: BMP-06-2025; approval date: 18 June 2025). The study was conducted in accordance with the principles of the Declaration of Helsinki. Due to the retrospective design, individual written informed consent was not obtained from patients, and all patient data were anonymized before analysis.

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Consent for publication

Not applicable.

Availability of data and materials

The data used or analyzed during the current study are not publicly available due to institutional and patient confidentiality. However, they may be obtained from the corresponding author upon reasonable request, provided that ethical and institutional permission is obtained.

Competing interests

The authors declare that they have no competing interests.

Funding

No external financial support was received for this study.

Authors' contributions

KG proposed the idea of the study, participated in its design, contributed to the interpretation of the results, and participated in the preparation of the manuscript. GM and AM participated in data collection and preparation of the manuscript. AA and VA contributed to clinical interpretation and performed critical revision of the manuscript. IB provided methodological supervision, participated in the interpretation of the results, and performed the final revision. All authors read and approved the final version of the manuscript.

Acknowledgement

The authors thank the staff of the Resuscitation and Intensive Care Department of Baku Medical Plaza for their support in the collection of clinical data and treatment of patients.

6. References

1. El-Ali, M. A. M., Sejópoles, M. D., & Gomes, L. T. (2023). Prediction of mortality in COVID-19 patients using diagnostic value of SaO2/FiO2 and PaO2/FiO2 ratios at hospital admission. Journal of Advances in Medicine and Medical Research.

2. Möhlenkamp, S., & Thiele, H. (2020). Ventilation of COVID-19 patients in intensive care units. Herz.

3. Gu, Y., Wang, D., Chen, C., Lu, W., Liu, H., Lv, T., Song, Y., & Zhang, F. (2021). PaO2/FiO2 and IL-6 are risk factors of mortality for intensive care COVID-19 patients. Scientific Reports.

4. Leoni, M., Lombardelli, L., Colombi, D., Bignami, E., Pergolotti, B., Repetti, F., Villani, M., Bellini, V., Rossi, T., Halasz, G., Caprioli, S., Micheli, F., & Nolli, M. (2021). Prediction of 28-day mortality in critically ill patients with COVID-19: Development and internal validation of a clinical prediction model. PLoS ONE.

5. Hueda-Zavaleta, M., Copaja-Corzo, C., Bardales-Silva, F., Flores-Palacios, R., Barreto-Rocchetti, L., & Benites-Zapata, V. A. (2022). Determination of PaO2/FiO2 as predictors of survival in critically ill patients. PeerJ.

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DOI:10.64288/6q482582
E-ISSN: 3106-4418

MedEpicent
Journal of Medical Education and Clinical Research

Received: 6 May 2026
Revised: 11 June 2026
Accepted: 27 June 2026
Published: 28 June 2026

6. Marra, A., D'Agnano, V., Pagliaro, R., Perrotta, F., Di Fiore, I., D'Orologio, A., Scialò, F., Schiattarella, A., Bianco, A., & Parrella, R. (2025). SpO2/FiO2 correlates with PaO2/FiO2 and radiological biomarkers of severity. Biomedicines.

7. Roozeman, J., Mazzinari, G., Serpa Neto, A., Hollmann, M. W., Paulus, F., Schultz, M. J., Pisani, L., & PRoVENT-COVID Collaborative Group. (2021). Prognostication using SpO2/FiO2 in invasively ventilated ICU patients with ARDS due to COVID-19. Journal of Critical Care.

8. Zinna, G., Pipitò, L., Colomba, C., Scichilone, N., Licata, A., Barbagallo, M., Russo, A., Coppola, N., & Cascio, A. (2024). The SpO2/FiO2 ratio combined with prognostic scores for pneumonia and COVID-19 increases their accuracy in predicting mortality of COVID-19 patients. Journal of Clinical Medicine.

9. Jiang, J., Wang, J., Yao, L., Lai, S., & Zhang, X. (2021). What do we know about IL-6 in COVID-19 so far? Biophysics Reports.

10.Laguna-Goya, R., Utrero-Rico, A., Talayero, P., Lasa-Lazáro, M., Ramírez-Fernández, A., Naranjo, L., Segura-Tudela, A., Cabrera-Marante, O., Rodríguez de Frías, E., García-García, R., Fernández-Ruiz, M., Aguado, J. M., Martínez-López, J., Lopez, E. A., Catalán, M., Serrano, A., & Paz-Artal, E. (2020). IL-6–based mortality risk model for hospitalized patients with COVID-19. Journal of Allergy and Clinical Immunology.

11. Kutsogiannis, D. J., Alharthy, A., Balhamar, A., Faqihi, F., Papanikolaou, J., Alqahtani, S., Memish, Z. A., Brindley, P. G., Brochard, L., & Karakitsos, D. (2022). Mortality and pulmonary embolism in acute respiratory distress syndrome from COVID-19 versus non-COVID-19. Frontiers in Medicine.

12. García-Gordillo, J. A., Camiro-Zúñiga, A., et al. (2021). COVID-IRS: A novel predictive score for risk of invasive respiratory support in patients with COVID-19. PLoS ONE.

13. Gutierrez-Zamudio, A. A. M., Alejandro-Salinas, A., et al. (2024). Prognostic performance of the age, PaO2/FiO2 ratio and plateau pressure score in mortality prediction. Therapeutic Advances in Infectious Disease.

14. Patil, V., Bhosale, S., Kshirsagar, A., Patil, H., & Patil, S. S. (2022). Outcome prediction and severity of coronavirus disease based on clinical and laboratory parameters. Clinical Diabetology.

15. Lai, W., Li, S., Du, Z., Ma, X., Lu, J., Gao, W., Abbott, G., Hu, Z., & Kang, Y. (2021). Severe patients with ARDS with COVID-19 treated with extracorporeal membrane oxygenation in China: A retrospective study. Frontiers in Medicine.

16. DesPrez, K., McNeil, J. B., Wang, C., Bastarache, J. A., Shaver, C. M., & Ware, L. B. (2017). Oxygenation saturation index predicts clinical outcomes in ARDS. Chest.

17. Sivakorn, C., Dechsanga, J., Jamjumrus, L., Boonnak, K., Schultz, M. J., Dondorp, A. M., Phumratanaprapin, W., Ratanarat, R., Naorungroj, T., Wattanawinitchai, P., Siripoon, T., Duangdee, C., & Techarang, T. (2021). High mobility group box 1 and interleukin 6 at intensive care unit admission as biomarkers in

Vol. 2 No. 2 (2026)
Original Article
DOI:10.64288/6q482582
E-ISSN: 3106-4418

Received: 6 May 2026
Revised: 11 June 2026
Accepted: 27 June 2026
Published: 28 June 2026

critically ill COVID-19 patients. The American Journal of Tropical Medicine and Hygiene.

18. Brücker, W., Mahabadi, A. A., Hüschen, A., Becker, J., Daehnke, S., & Möhlenkamp, S. (2021). Clinical characteristics and determinants of mortality in coronavirus disease 2019 patients on an intensive care unit: A retrospective explorative study. Journal of Thoracic Disease.

19. Huber, W., Findeisen, M., Lahmer, T., Herner, A., Rasch, S., Mayr, U., Hoppmann, P., Jaitner, J., Okrojek, R., Brettner, F., Schmid, R. M., & Schmidle, P. (2020). Prediction of outcome in patients with ARDS: A prospective cohort study comparing ARDS definitions and other ARDS-associated parameters, ratios and scores at intubation and over time. PLoS ONE.

20. Sinha, P., Calfee, C. S., Cherian, S., Brealey, D., Cutler, S., King, C., Killick, C., Richards, O., Cheema, Y., Bailey, C., Reddy, K., Delucchi, K. L., Shankar-Hari, M., Gordon, A. C., Shyamsundar, M., O'Kane, C. M., McAuley, D. F., & Szakmany, T. (2020). Prevalence of phenotypes of acute respiratory distress syndrome in critically ill patients with COVID-19: A prospective observational study. The Lancet Respiratory Medicine.

21. Kumari, B., Bankul, A., Kaushik, A., Bansal, A., Sharma, S., & Banerjee, A. (2023). The second wave of COVID-19 wreaked havoc: A look at clinical and laboratory parameters of survivors and non-survivors admitted to intensive care unit. Journal of Family Medicine and Primary Care.

22. Nozari, A., Mukerji, S., Vora, M., García, A., Park, A., Flores, N., Canelli, R. J., Rodriguez, G., Pinciroli, R., Nagrebetsky, A., Ortega, R., & Quraishi, S. A. (2021). Postintubation decline in oxygen saturation index predicts mortality in COVID-19: A retrospective pilot study. Critical Care Research and Practice.

23. Lee, S. I., Kang, D., Ahn, H., Kim, M. J., Shim, M. S., & Lee, J. E. (2022). Age is an important prognostic factor in COVID-19 patients treated with extracorporeal membrane oxygenation. Journal of Thoracic Disease.

Vol. 2 No. 2 (2026)
Original Article
DOI:10.64288/6q482582
E-ISSN: 3106-4418