International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Predictive Factors of Mortality in Elderly Patients Admitted to the Intensive Care Unit: Experience from the Polyvalent ICU of University hospital Centre Hassan II, Morocco

Dr. Anasse El Azzaoui[1], Dr. Ayoub Khallati[2], Prof. Dr. Abdelkarim Shimi[3], Prof. Dr. Ali Derkaoui[4], Prof. Dr. Brahim Bechri[5], Prof. Dr. Mohammed Khatouf[6]

[1,2]Resident, Anesthesia And Critical Care, Uhc Hassan 2 Of Fez
[3,4,5,6]Professor, Anesthesia And Critical Care, Uhc Hassan 2 Of Fez

Abstract:
Background: Elderly patients represent a growing proportion of ICU admissions and are associated with high mortality rates. Identifying predictors of poor outcome is critical to optimize care and inform clinical decision-making.
Methods: We conducted a retrospective observational study in the polyvalent ICU of UHC Hassan II between January 2020 and December 2021. All patients aged 65 years and older admitted during the study period were included. Demographic data, comorbidities, admission diagnoses, organ dysfunction scores, and therapeutic interventions were collected. Univariate and multivariate logistic regression analyses were used to identify independent predictors of mortality.
Results: A total of 102 patients were included (mean age 73.4 ± 6.1 years, 54% male). The overall mortality rate was 45%. The most common reasons for ICU admission were the neurologic distress (35%), postoperative monitoring (21%), and polytrauma (16%). Non-survivors had significantly higher SOFA (6.4 ± 3) and APACHE II scores (19.84 ± 5.46) than survivors (SOFA 3.5 ± 2.5; APACHE II 14.05 ± 5.31; $p < 0.001$). Acute kidney injury, shock, and mechanical ventilation were more frequent among non-survivors. Multivariate analysis identified high SOFA and APACHE II scores, shock, AKI, and invasive ventilation as independent predictors of mortality.
Conclusion: Elderly ICU patients have high mortality rates. Early identification of severity indicators—particularly SOFA, APACHE II, and organ support requirements—can aid in prognostication and guide appropriate care strategies.

Keywords: elderly, intensive care, mortality,UHC HASSAN 2, Morocco , SOFA, acute kidney injury, shock

Introduction

The aging population has led to an increasing number of elderly patients admitted to intensive care units (ICUs) worldwide. These patients present unique challenges due to reduced physiological reserves, higher

comorbidity burdens, and atypical presentations of acute illness. Despite advances in critical care, outcomes in this population remain poor. This study aims to identify the clinical and biological predictors of mortality in elderly ICU patients in a tertiary care setting.

Methods

We conducted a retrospective observational study over a two-year period (January 2020–December 2021) in the polyvalent ICU of UHC Hassan II of Fez , Morocco. Inclusion criteria were patients aged 65 years and above admitted to the ICU. We collected demographic data, comorbidities, primary reasons for admission, severity scores (SOFA and APACHE II), organ dysfunction, and therapeutic interventions. The primary outcome was in-hospital mortality. Statistical analyses included univariate and multivariate logistic regressions using SPSS software. A p-value < 0.05 was considered statistically significant.

Results

A total of 215 patients aged 65 years and older were included. The mean age was 73.4 ± 6.1 years, with a male predominance (sex ratio = 1.16). The most frequent comorbidities were cardio-vasculaire deseases (59%), diabetes mellitus (33%), and neuro-pathologies (22.8%) (Figure 1).

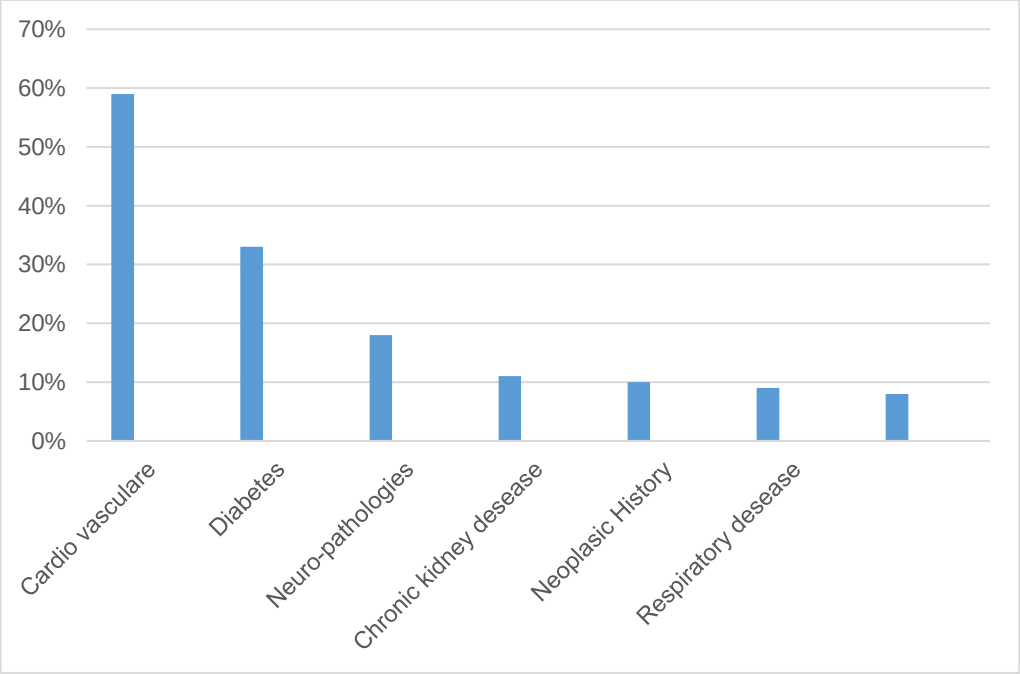

Figure 1 :Distribution of patients according to comorbidities

The main reasons for ICU admission were the neurologic distress (35%), postoperative monitoring (21%), and polytrauma (16%) (Figure 2). On admission, the average APACHE II score was 17 ± 6.1, and the mean SOFA score was 5 ± 3.1.

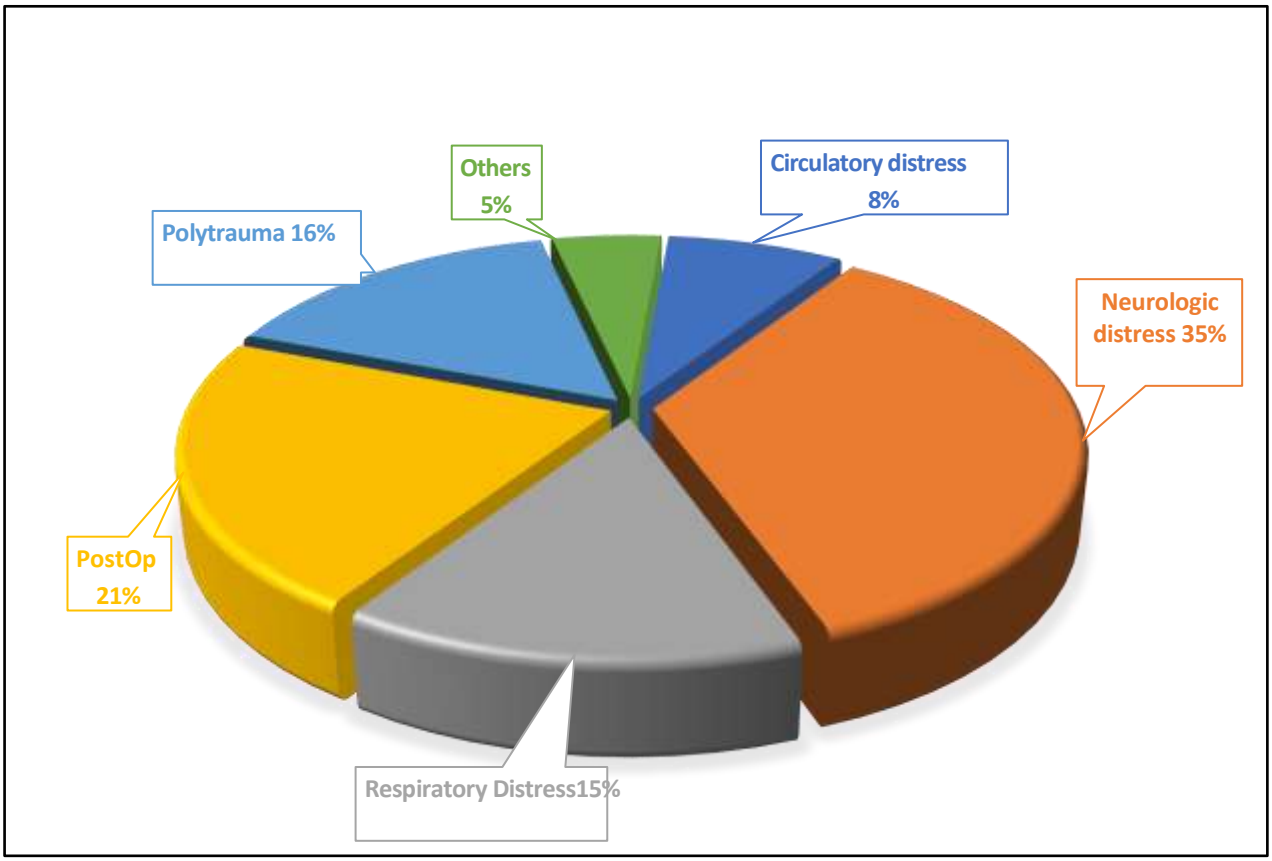

Figure 2 :Distribution of Patients According to Reason for Admission

The overall mortality rate was 45% (46 deaths). Deceased patients had significantly higher APACHE II (19.84 ± 5.46 vs. 14.05 ± 5.31; $p < 0.001$) and SOFA scores (6.4 ± 3 vs. 3.5 ± 2.5; $p < 0.001$) compared to survivors.

Acute kidney injury (AKI), shock at admission, and invasive mechanical ventilation were significantly associated with mortality (Table 1). AKI was present in 65.9% of deceased patients compared to 37.4% of survivors ($p < 0.001$). Shock occurred in 55.3% of non-survivors versus 29.3% of survivors ($p < 0.001$). Intubation was more frequent among non-survivors (76.4%) than survivors (38.4%) ($p < 0.001$).

Reason of admission	Survivors (56)	Non-survivors (46)	P value
Circulatory distress	3	5	
Neurologic distress	14	22	
Respiratory distress	9	6	
Post-op	19	3	
Polytrauma	8	8	<0,003

Table 1 :MORTALITY ACCORDING TO THE ADMISSION REASON

In multivariate analysis (Table 2), the following factors independently predicted mortality:

- Higher SOFA score ($p = 0.002$)
- Elevated APACHE II score ($p = 0.014$)
- Presence of shock ($p = 0.005$)

- Acute kidney injury (p = 0.017)
- Invasive mechanical ventilation (p = 0.003)

Gravity score	Survivors (56)	Non-Survivors (46)	P value
APACHE II	14 ± 5,3	19,8 ± 5,4	<0,001
SOFA	3,5 ± 2,5	6,4 ± 3	<0,001
IGS II	32,1 ± 10,3	43,6 ± 10,6	<0,001

Table 2 :Multivariate logistic regression analysis of mortality predictors

Discussion

This study confirms the high mortality rate among elderly ICU patients, consistent with rates reported in prior studies [3], [10], [12]. The independent predictors of mortality—high SOFA and APACHE II scores, shock, AKI, and mechanical ventilation—are all markers of acute severity and organ failure.

The SOFA score, reflecting dysfunction across organ systems, emerged as the strongest predictor of outcome. This reinforces prior research supporting its prognostic utility in ICU settings [6], [9]. The APACHE II score, though developed for general ICU populations, remains valid in geriatric cohorts [5], [13].

Shock at admission indicates hemodynamic instability and correlates with high mortality, consistent with sepsis-related literature [7], [11]. AKI, prevalent among the deceased, reflects poor renal perfusion or sepsis-related injury, with significant prognostic implications [14]. The need for invasive ventilation, while often lifesaving, is associated with worse outcomes due to underlying respiratory failure and iatrogenic complications [15], [16].

Our findings emphasize the importance of early, accurate prognostication in elderly ICU patients to guide therapeutic intensity, resource allocation, and discussions regarding goals of care [17].

Limitations include its retrospective nature, single-center scope, and lack of post-discharge functional outcomes.

Conclusion

Elderly patients admitted to the ICU face high mortality, particularly in the presence of severe organ dysfunction, shock, and need for organ support. Early identification of these predictors can support clinical decision-making and may prompt consideration of care limitation in selected patients.

References :

1. Ageing and health n.d. https://www.who.int/news-room/fact- sheets/detail/ageing-and-health (accessed November 29, 2024).
2. HCP : HAUT COMMISSARIAT DES PLANS. Enquête nationale sur les personnes âgées au Maroc : rapport (en ligne) n.d.
3. Rowe JW, Kahn RL. Human Aging: Usual and Successful. Science 1987;237:143–9. https://doi.org/10.1126/science.3299702.
4. Seguin P, Malledant Y. Admission et devenir du sujet âgé en réanimation. n.d.
5. Laszlo A, Janssens J-P, Chevrolet J-C. Prise en charge de patients âgés en milieu de soins aigus. Rev Médicale Suisse 2001;59:2215–8. https://doi.org/10.53738/REVMED.2001.59.2368.2215.
6. La SRLF | SRLF n.d. https://www.srlf.org/srlf (accessed January 1, 2025).

7. Gouzes C, Tarıght N, Doise J, Guidet B. THESAURUS de REANIMATION et U.S.C.
8. Charlson ME, Pompei P, Ales KL, MacKenzie CR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. J Chronic Dis 1987;40:373–83. https://doi.org/10.1016/0021-9681(87)90171-8.
9. Le Gall J-R, Lemeshow S, Saulnier F. A New Simplified Acute Physiology Score (SAPS II) Based on a European/North American Multicenter Study. JAMA 1993;270:2957–63. https://doi.org/10.1001/jama.1993.03510240069035.
10. Knaus WA, Draper EA, Wagner DP, Zimmerman JE. APACHE II: A severity of disease classification system. Crit Care Med 1985;13:818.
11. The SOFA score—development, utility and challenges of accurate assessment in clinical trials | Critical Care n.d. https://link.springer.com/article/10.1186/s13054-019-2663-7 (accessed January 2, 2025).
12. Girault C, Auriant I, Jaber S. Procédures de sécurisation au cours de la ventilation mécanique invasive. Réanimation 2008;17:534–47. https://doi.org/10.1016/j.reaurg.2008.06.014.
13. Petit JY, Gaussorgues P, Salord F, Sirodot M, Langevin B, Robert D. Étude prospective des complications de la ventilation mécanique observées chez 126 patients. Réanimation Urgences 1993;2:521–6. https://doi.org/10.1016/S1164- 6756(05)80139-2.
14. Brown SM, Lanspa MJ, Jones JP, Kuttler KG, Li Y, Carlson R, et al. Survival After Shock Requiring High-Dose Vasopressor Therapy. Chest 2013;143:664–71. https://doi.org/10.1378/chest.12-1106.
15. Ylimartimo AT, Koskela M, Lahtinen S, Kaakinen T, Vakkala M, Liisanantti J. Outcomes in patients requiring intensive care unit (ICU) admission after emergency laparotomy: A retrospective study. Acta Anaesthesiol Scand 2022;66:954–60. https://doi.org/10.1111/aas.14103.
16. Sabharwal S, Wilson H, Reilly P, Gupte CM. Heterogeneity of the definition of elderly age in current orthopaedic research. SpringerPlus 2015;4:516. https://doi.org/10.1186/s40064-015-1307-x.
17. Sabharwal S, Wilson H, Reilly P, Gupte CM. Heterogeneity of the definition of elderly age in current orthopaedic research. SpringerPlus 2015;4:516. https://doi.org/10.1186/s40064-015-1307-x.