

## Epidemiological Profile and Outcomes of Patients Admitted for Coma in a General Intensive Care Unit: A Retrospective Study

Imane EL AZZOUZI<sup>1</sup>, Asmae CHAKER<sup>1\*</sup>, Hamza TALBI<sup>1</sup>, Ahmed EL HIJRI<sup>1</sup><sup>1</sup>Department of Anesthesiology and Critical Care, Teaching Hospital Ibn Sina of Rabat, Faculty of Medicine, Mohamed V University in Rabat, MoroccoDOI: <https://doi.org/10.36347/sjams.2026.v14i07.006>

| Received: 23.05.2026 | Accepted: 06.07.2026 | Published: 11.07.2026

\*Corresponding author: Asmae CHAKER

Department of Anesthesiology and Critical Care, Teaching Hospital Ibn Sina of Rabat, Faculty of Medicine, Mohamed V University in Rabat, Morocco

## Abstract

## Original Research Article

**Background:** Coma is a severe disorder of consciousness and represents a frequent medical and surgical emergency associated with high morbidity and mortality. Early identification of prognostic factors remains a major challenge in intensive care. **Aim:** To describe the epidemiological profile of patients admitted for coma to a general intensive care unit (ICU) and to identify predictors of mortality. **Methods:** We conducted an observational retrospective study including 100 patients admitted for coma (Glasgow Coma Scale  $\leq 12$ ) to the ICU of Lalla Aicha Hospital in Temara-Rabat between August 2024 and May 2025. Demographic, clinical, laboratory and outcome data were collected using a standardized data collection form. Univariate and multivariate analyses were performed to identify factors independently associated with mortality. **Results:** Coma accounted for 21.6% of ICU admissions. The median age of patients was 55.5 years, with a male predominance (male-to-female ratio 2.3). Non-traumatic coma represented 67% of cases, while traumatic coma accounted for 33%. Metabolic causes were the most frequent non-traumatic etiologies (30%), followed by infectious (15%), neurological (13%) and toxic causes (9%). Overall mortality was 38%. In univariate analysis, mortality was associated with advanced age, anemia, duration of coma and higher SOFA score. In multivariate analysis, a SOFA score  $\geq 10$  remained the only independent predictor of mortality (OR 24.5; 95% CI 7.55–79.6;  $p < 0.01$ ). **Conclusion:** Mortality among patients admitted for coma to the ICU remains high. The severity of organ dysfunction assessed by the SOFA score appears to be a major determinant of prognosis. Early risk stratification at ICU admission may help optimize management and improve patient outcomes.

**Keywords:** Coma, Intensive care unit, SOFA score, Mortality, Critical care epidemiology.

Copyright © 2026 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

## INTRODUCTION

Acute disorders of consciousness represent a frequent cause of admission to emergency departments and intensive care units (ICUs). Coma, defined as a profound impairment of arousal and awareness, is the most severe form of these disorders and constitutes a major medical emergency associated with significant morbidity and mortality [1–4].

The etiologies of coma are highly heterogeneous and include traumatic brain injury, structural neurological lesions, metabolic disturbances, infections and toxic causes. The clinical course and prognosis vary widely depending on the underlying cause and the severity of associated organ dysfunction. Previous studies have reported mortality rates ranging from 5% to 30% in patients admitted for coma, with higher rates observed in severe forms [5].

In intensive care settings, the management of comatose patients remains challenging due to the diversity of etiologies and the frequent presence of multiorgan failure. Early identification of prognostic factors is therefore essential to improve risk stratification and guide therapeutic strategies.

The aim of this study was to describe the epidemiological profile of patients admitted for coma to a general intensive care unit and to identify factors associated with mortality.

## METHODS

### Study design and setting

This was a retrospective observational descriptive and analytical study conducted in the general intensive care unit of Lalla Aicha Hospital in Temara-Rabat, Morocco. The study was carried out over a 10-month period, from 1 August 2024 to 21 May 2025.

**Citation:** Imane EL AZZOUZI, Asmae CHAKER, Hamza TALBI, Ahmed EL HIJRI. Epidemiological Profile and Outcomes of Patients Admitted for Coma in a General Intensive Care Unit: A Retrospective Study. Sch J App Med Sci, 2026 Jul 14(7): 1037-1042.

### Study population

All consecutive patients admitted to the ICU for coma during the study period were eligible for inclusion. Coma was defined as a Glasgow Coma Scale (GCS) score  $\leq 12$  assessed at ICU admission before the administration of sedative medication.

Patients receiving sedative drugs prior to neurological evaluation and patients with incomplete or non-exploitable medical records were excluded.

### Data collection

Clinical data were retrospectively extracted from medical records and collected using a standardized data collection form.

The following variables were analysed:

#### Demographic data

- age
- sex
- comorbidities

#### Clinical data at ICU admission

- Glasgow Coma Scale (GCS) score
- Pupillary abnormalities
- Focal neurological signs
- Presence of shock, defined as systolic blood pressure  $< 90$  mmHg
- Peripheral oxygen saturation (SpO<sub>2</sub>)

Severity of organ dysfunction was assessed using the Sequential Organ Failure Assessment (SOFA) score calculated at ICU admission.

#### Laboratory parameters

- serum electrolytes
- blood glucose
- serum sodium
- serum creatinine
- hemoglobin level
- arterial blood gas parameters

#### Radiological findings

Brain computed tomography (CT) findings were recorded when available.

#### Outcome data

- Duration of coma
- Duration of mechanical ventilation
- Length of ICU stay
- ICU complications
- Mortality

#### Study outcome

The primary outcome of the study was to identify factors associated with mortality among patients admitted to the ICU for coma.

### Statistical analysis

Statistical analysis was performed using Excel and Jamovi software (version 2.6.26).

Quantitative variables were expressed as median and interquartile range. Qualitative variables were expressed as numbers and percentages.

Comparisons between survivors and non-survivors were performed using the Chi-square test or Fisher's exact test for categorical variables and the Student's t-test or Mann-Whitney U test for continuous variables, as appropriate.

Variables with a p-value  $< 0.20$  in univariate analysis were entered into a multivariate logistic regression model to identify independent predictors of mortality.

Results were expressed as odds ratios (OR) with 95% confidence intervals (95% CI).

A p-value  $< 0.05$  was considered statistically significant.

### Ethical considerations

The study protocol was approved by the institutional ethics committee of faculty of medicine et pharmacy of rabat, Morocco. Due to the retrospective design of the study and the use of anonymised data, the requirement for informed consent was waived.

## RESULTS

### Study population

During the study period, 463 patients were admitted to the intensive care unit. Among them, 100 patients were admitted for coma, corresponding to 21.6% of ICU admissions.

The median age of patients was 55.5 years [24–68], with a range from 14 to 93 years. The study population showed a male predominance (70%), corresponding to a male-to-female ratio of 2.3.

The most common comorbidities were diabetes mellitus (29%), hypertension (16%), and ischemic heart disease (7%). A history of tobacco use was reported in 26% of patients.

### Clinical and paraclinical characteristics at admission

Neurological severity at admission varied among patients. Twenty percent of patients had a GCS score  $\leq 8$ , including 12% with a GCS  $\leq 6$ . Pupillary abnormalities were observed in 19% of patients.

Hemodynamic instability was present in 12% of patients, defined as systolic blood pressure  $< 90$  mmHg. Hypoxemia (SpO<sub>2</sub>  $< 92\%$ ) was observed in 42% of cases.

The median SOFA score at admission was 8 [5–11.3], and 37% of patients had a SOFA score  $\geq 10$ ,

indicating significant multiorgan dysfunction in more than one-third of cases.

Metabolic abnormalities were frequent. Hyperglycemia (>2 g/L) was observed in 35% of patients, while dysnatremia occurred in 38%, including hypernatremia (26%) and hyponatremia (12%).

Renal impairment was present in 35% of patients, and anemia (hemoglobin <10 g/dL) was documented in 19% of cases. Additionally, 58% of patients presented with an acid–base disorder at admission.

Brain computed tomography was performed systematically and revealed abnormal findings in 48% of cases.

#### Etiologies of coma

Among the 100 patients included, 67% presented with non-traumatic coma, while 33% had traumatic coma.

Among non-traumatic comas, metabolic causes were the most frequent, identified in 30 patients. Infectious causes accounted for 15 cases, and neurological causes for 13 cases. Toxic etiologies were identified in 9 patients (Table 1).

**Table 1: Etiologies of coma**

Etiology	Number of cases, n (%)
Metabolic	30 (30%)
Infectious	15 (15%)
Neurological	13 (13%)
Toxic	9 (9%)
Traumatic	33 (33%)

#### Management in the intensive care unit

Management of comatose patients involved both etiological and supportive treatments.

Invasive mechanical ventilation was required in 63% of patients. Hemodynamic support with vasoactive agents was administered in 57%, with norepinephrine being the most commonly used vasopressor.

Renal replacement therapy was required in 6% of patients. Neurosurgical intervention was performed in 4 patients.

The median duration of coma was 3 days [1-7].

The median duration of mechanical ventilation was 3 days [4].

The median length of ICU stay was 5 days [3–14].

#### Complications

ICU-related complications were mainly infectious.

Ventilator-associated pneumonia occurred in 36% of patients, followed by catheter-associated urinary tract infections (13%). Secondary meningoenzephalitis and infected pressure ulcers were less frequent, occurring in 4% and 3%, respectively.

Neurological complications included generalized seizures in 18% of patients. ICU-acquired neuromyopathy and secondary ischemic stroke were each observed in 4% of cases.

Metabolic complications were also observed. Hypernatremia developed in 14% of patients, acute renal impairment in 13%, and hyponatremia in 1%.

Cardiovascular complications included cardiac arrhythmias (4%), heart failure exacerbation (2%), and

pericardial effusion (2%). One case of deep vein thrombosis was reported.

Hematological complications included anemia in 15% and thrombocytopenia in 7% of patients.

#### Mortality

Among the 100 patients admitted for coma, 38 patients died, corresponding to a mortality rate of 38%.

The causes of death were predominantly infectious. Septic shock was the leading cause of death, occurring in 23 patients, representing 23% of the entire cohort and 60.5% of deaths.

Neurological causes were the second most frequent cause of death (12% of the cohort), including seven cases of brain death or cerebral herniation and five cases of massive ischemic stroke. Hemorrhagic shock was responsible for death in 3 patients (3%).

#### Factors associated with mortality

Risk factors for mortality identified in univariate and multivariate analyses are presented in Tables 2 and 3.

In univariate analysis, advanced age, anemia, longer duration of coma, and higher SOFA score were significantly associated with mortality.

In multivariate logistic regression analysis, only a SOFA score  $\geq 10$  remained independently associated with mortality, with an odds ratio of 24.53 (95% CI 7.55–79.6;  $p < 0.01$ ).

**Table 2: Predictors of mortality identified in univariate analysis**

Variable	Survivors (n = 62)	Non-survivors (n = 38)	p-value
Age*	45 [23–67]	62.5 [39.25–71.5]	0.015
Male sex †	43 (69%)	27 (71%)	0.84
Diabetes mellitus†	18 (29%)	11 (29%)	1.00
Traumatic coma†	20 (32%)	13 (34%)	1.00
Non-traumatic coma†	42 (68%)	25 (66%)	1.00
GCS ≤6†	7 (11.3%)	5 (13.2%)	0.76
Pupillary abnormalities†	12 (19.4%)	10 (26.3%)	0.433
Shock†	6 (10%)	6 (16%)	0.37
SpO <sub>2</sub> <92%†	23 (37%)	19 (50%)	0.18
SOFA score*	6 [3.25–8]	12 [10–14.75]	<0.001
SOFA score ≥10†	8 (13%)	29 (76%)	<0.001
Anemia†	5 (7.9%)	10 (26.3%)	0.020
Duration of coma (days)*	2 [1–7]	4 [2.25–16]	0.002

\* Median [interquartile range]

† Number (%)

**Table 3: Independent predictors of mortality identified by multivariable logistic regression**

Variable	Odds Ratio	95% CI	p-value
Age	1.03	0.99 – 1.05	0.06
Anemia	3.03	0.49 – 18.56	0.23
Duration of coma	1.06	0.97 – 1.13	0.156
SOFA score ≥10	24.53	7.55 – 79.6	<0.01

## DISCUSSION

Acute disorders of consciousness represent a frequent cause of admission to emergency departments and intensive care units (ICUs). Coma, defined as a profound impairment of arousal and awareness, is the most severe form of these disorders and is associated with significant morbidity and mortality [1–4]. In the present study, patients admitted for coma accounted for 21.6% of ICU admissions, highlighting the clinical importance of this condition in critical care settings.

The median age of our cohort was 55.5 years, which is consistent with data reported in international series where the mean age generally ranges between 55 and 60 years [1,5]. As reported in previous studies, a male predominance was observed in our population (70%). This difference was particularly marked in traumatic coma, where men represented the vast majority of cases. Similar findings have been reported in studies from Qatar, Japan and South Korea, where the proportion of male patients with traumatic brain injury ranged from 67% to 94% [6–8].

Non-traumatic coma encompasses a wide range of etiologies reflecting heterogeneous pathophysiological mechanisms. According to a systematic review including 14 studies, the most common causes include stroke, post-anoxic injury, metabolic disorders, intoxications and severe infections [9]. Structural neurological lesions may account for 6% to 54% of cases depending on the series, with particularly high mortality rates in hemorrhagic or large ischemic strokes [9]. Metabolic causes also represent a major

etiology and may account for up to 29% of non-traumatic comas in some cohorts [9].

In our study, non-traumatic coma represented 67% of cases. Metabolic etiologies were the most frequent causes, followed by infectious and neurological causes. This distribution differs from that reported in several European and Asian studies where structural neurological causes predominate [9]. However, studies conducted in African settings have reported similar patterns with a high proportion of metabolic and infectious causes, reflecting regional epidemiological characteristics and differences in access to healthcare [10,11]. The heterogeneity of etiologies may also have influenced patient outcomes and should therefore be considered when interpreting these findings.

Infectious etiologies remain an important cause of coma in low- and middle-income countries. These conditions may involve direct central nervous system infections such as meningitis and encephalitis, or indirect mechanisms such as sepsis-associated encephalopathy [12,13]. Toxic comas, mainly related to drug intoxication, represent another important group of potentially reversible causes and account for a highly variable proportion of cases across studies [9].

The proportion of traumatic coma observed in our study (33%) appears higher than that reported in large Western cohorts, where it generally does not exceed 10% [1,5]. This difference may reflect the higher incidence of road traffic accidents and trauma observed in many developing countries.

Mortality among patients admitted to the ICU for coma varies widely in the literature. Reported mortality rates range from approximately 5% to 25% in large heterogeneous ICU populations [1,14,15], but may be substantially higher in studies focusing on severe coma [9]. In our study, mortality reached 38%, reflecting the severity of the population admitted to our ICU.

Our univariate analysis showed that age, anemia, duration of coma and the SOFA score were significantly associated with mortality. However, after adjustment in multivariate analysis, only a SOFA score  $\geq 10$  remained independently associated with increased mortality, with a 24.5-fold higher risk of death. This finding highlights the central role of organ dysfunction severity in determining prognosis among comatose patients admitted to the ICU.

These findings are consistent with previous studies showing that prognosis in coma is not determined solely by the neurological condition but also by the presence of systemic organ failure. In a large population-based cohort, Lin *et al.*, reported that mortality was associated with several clinical characteristics including age, comorbidities and underlying etiology [1]. Similarly, the systematic review by Horsting *et al.*, emphasized the major prognostic impact of etiology and coma severity, with particularly high mortality in post-anoxic and vascular causes [9].

Studies conducted in African hospital settings have also reported high mortality rates in patients with coma. In the study by Gams Massi *et al.*, which included 408 patients with non-traumatic coma admitted to the emergency department, mortality reached 66.4%. Predictors of mortality included deep coma, elevated creatinine and the use of vasopressors [11]. Similarly, Mateso *et al.*, reported a mortality rate of 35.2% in ICU patients with non-traumatic coma, with depth of coma identified as the most important prognostic factor [10].

In the context of traumatic coma, several studies have also identified neurological severity as an important determinant of outcome. Réa-Neto *et al.*, reported a mortality rate of 27.6% among ICU patients with traumatic brain injury, with advanced age, high APACHE II score, low GCS and associated extracranial trauma identified as independent predictors of mortality [16]. Similarly, Mkubwa *et al.*, reported a mortality rate of 35% in patients admitted to the ICU for traumatic brain injury, with coma depth assessed by the GCS significantly associated with mortality [17].

Some of the findings from the reviewed studies are consistent with those of our study. Our data suggest that, in a population of comatose patients admitted to a general ICU, mortality is primarily determined by the severity of organ dysfunction at admission rather than by the type of coma or isolated neurological signs. The systematic use of a severity score such as SOFA at

admission could therefore contribute to early risk stratification and more efficient allocation of resources. However, these results should be interpreted with caution due to the retrospective and single-centre design of our study, as well as the limited sample size.

### Limitations

This study has several limitations. First, it was a retrospective single-centre study, which may limit the generalizability of the findings. Second, the sample size was relatively small, which may have reduced the statistical power to identify additional predictors of mortality. Third, the heterogeneity of coma etiologies may have influenced outcome analysis. Finally, detailed neurological prognostic tools such as electroencephalography or advanced neuroimaging were not systematically available for all patients.

Despite these limitations, our study provides valuable insight into the epidemiological profile and prognosis of coma in a general ICU in a North African setting. Our findings suggest that early assessment of organ dysfunction severity using the SOFA score may be particularly useful for risk stratification in comatose patients.

## CONCLUSION

Coma, whether traumatic or non-traumatic, is a life-threatening condition in intensive care, marked by substantial etiological and prognostic variability. Early assessment and appropriate management play a crucial role in determining patient outcomes.

In our cohort of patients admitted to the ICU for coma, mortality was high and was primarily determined by the severity of organ dysfunction at admission. A SOFA score  $\geq 10$  was the only independent predictor of mortality, underscoring the central role of multiorgan failure in determining prognosis.

These findings highlight the importance of early and systematic assessment of overall severity in all comatose patients admitted to the ICU, regardless of the initial etiology. Larger multicenter studies are needed to confirm these observations and to refine prognostic stratification in this high-risk population

## REFERENCES

1. Lin CY, *et al.*, Incidence, causes and prognostic outcomes of acute coma: a nationwide population-based retrospective cohort study in Taiwan. *BMJ Open*. 2025; 15(5):e086789. doi:10.1136/bmjopen-2024-086789.
2. Xiao HY, Wang YX, Xu TD, *et al.*, Evaluation and treatment of altered mental status patients in the emergency department: life in the fast lane. *World J Emerg Med*. 2012;3(4):270-277.

3. Samborska-Sablik A, Gaszyński W, Gaszyński T, *et al.*, Coma—the interdisciplinary problem. *Pol Merkur Lekarski*. 2005; 18:703-708.
4. Ariño H, *et al.*, Identifying encephalopathy in patients admitted to an intensive care unit: going beyond structured information using natural language processing. *Front Digit Health*. 2023; 5:1085602. doi:10.3389/fgth.2023.1085602.
5. Kondziella D, *et al.*, Incidence and prevalence of coma in the UK and the USA. *Brain Commun*. 2022; 4(5):fcac188. doi:10.1093/braincomms/fcac188.
6. El-Menyar A, Mekkodathil A, Verma V, Wahlen BM, Peralta R, Taha I, *et al.*, Gender discrepancy in patients with traumatic brain injury: a retrospective study from a level 1 trauma centre. *Biomed Res Int*. 2022; 2022:3147340.
7. Hosomi S, Kitamura T, Sobue T, Ogura H, Shimazu T. Sex and age differences in isolated traumatic brain injury: a retrospective observational study. *BMC Neurol*. 2021; 21(1):261. doi:10.1186/s12883-021-02305-6.
8. Eom KS, Kim JH, Yoon SH, Lee SJ, Park KJ, Ha SK, *et al.*, Gender differences in adult traumatic brain injury according to the Glasgow coma scale: a multicenter descriptive study. *Chin J Traumatol*. 2021; 24(6):333-343. doi:10.1016/j.cjtee.2021.06.004.
9. Horsting MWB, Franken MD, Meulenbelt J, van Klei WA, de Lange DW. The etiology and outcome of non-traumatic coma in critical care: a systematic review. *BMC Anesthesiol*. 2015; 15:65.
10. Mateso GQ, Makali S, Shamamba A, Ntaboba B, Urbain V, Eric M, *et al.*, Etiologies and factors associated with mortality in patients with non-traumatic coma in a tertiary hospital in Bukavu, eastern Democratic Republic of the Congo. *Heliyon*. 2023; 9(8):e18398.
11. Gams Massi D, Mbogne AHK, Siysi VV, Mbengono JAM, Magnerou AM, Bila LGE, *et al.*, Outcome of non-traumatic coma in a tertiary referral hospital in Cameroon. *Afr J Emerg Med*. 2024; 14(3):179-185.
12. Chaudhry N, Duggal AK. Sepsis associated encephalopathy. *Adv Med*. 2014; 2014:762320. doi:10.1155/2014/762320.
13. Gofton TE, Young GB. Sepsis-associated encephalopathy. *Nat Rev Neurol*. 2012; 8(10):557-566.
14. Bauer M, *et al.*, Causes of coma and their evolution in the medical intensive care unit. *J Neurol*. 2011; 258:2063-2072. doi:10.1007/s00415-011-6388-z.
15. Völk S, *et al.*, Impaired consciousness in the emergency department. *Eur Neurol*. 2018; 80(3-4):179-186. doi:10.1159/000495363.
16. Réa-Neto Á, *et al.*, Epidemiological and clinical characteristics predictive of ICU mortality of patients with traumatic brain injury treated at a trauma referral hospital: a cohort study. *BMC Neurol*. 2023; 23(1):101. doi:10.1186/s12883-023-03145-2.
17. Mkubwa JJ, *et al.*, Traumatic brain injury: association between the Glasgow coma scale score and intensive care unit mortality. *S Afr J Crit Care*. 2022; 38(2). doi:10.7196/SAJCC. 2022.v38i2.525.