

Study of Outcome Analysis of Unconscious Patients in Emergency Department at Tertiary Care Hospital

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ABSTRACT

PURPOSE: To analyse the clinical profile, etiological distribution, and 7-day outcome of unconscious patients presenting to the emergency department of a tertiary care hospital.

METHODS: This hospital-based prospective observational study was conducted in the Department of Emergency Medicine, Muzaffarnagar Medical College and Hospital. One hundred consecutive patients with non-traumatic unconsciousness and Glasgow Coma Scale (GCS) score ≤ 8 were enrolled. Patients with trauma, age below 5 years, dementia, delirium, or irreversible brain damage were excluded. Clinical evaluation, laboratory investigations, and indicated neuroimaging were performed according to institutional protocols. Patients were followed for 7 days, and outcomes were categorized as improved, no improvement, or death.

RESULTS: The mean age of the study population was 51.41 ± 19.71 years, and 68.0% of patients were older than 40 years. Females constituted 58.0% of cases, 57.0% were referred from peripheral facilities, and abnormal pupils were observed in 54.0%. Hypoxic (23.0%) and metabolic (21.0%) causes were the most common etiologies, followed by central nervous system infection (15.0%) and stroke (14.0%). All patients required intensive care unit admission and ventilatory support. At 7 days, 59.0% improved, 21.0% showed no improvement, and 20.0% died. Lower GCS subgroup and abnormal pupil status were significantly associated with adverse outcome.

CONCLUSION: Non-traumatic unconsciousness in the emergency department is associated with substantial morbidity, prolonged hospitalization, and considerable mortality. Admission neurological severity, particularly GCS subgroup and pupil status, remains clinically useful for early risk stratification.

KEYWORDS: Unconsciousness; Emergency department; Glasgow Coma Scale; Non-traumatic coma; Outcome; Prognosis

INTRODUCTION

Unconsciousness is one of the most critical presentations encountered in the emergency department because delayed recognition and treatment may rapidly lead to irreversible neurological injury or death.¹⁻

³ In patients without trauma, the diagnostic challenge is even greater because the precipitating event is

often unclear, history is frequently unavailable, and the underlying cause may range from reversible metabolic derangements to devastating cerebrovascular or hypoxic insults.¹⁻³

Consciousness depends on the integrity of the ascending reticular activating system and its cortical connections. Disturbance of these pathways by hypoxia, metabolic dysfunction, sepsis, infection, poisoning, or vascular compromise may produce global cerebral dysfunction and severe depression of sensorium.^{2,4} The Glasgow Coma Scale (GCS) remains the most practical bedside tool for grading severity, and lower scores have consistently been associated with worse outcomes in non-traumatic coma.^{4,5}

The etiological spectrum of non-traumatic unconsciousness varies across institutions and populations, but adult intensive care and emergency-based series have shown that metabolic encephalopathy, hypoxic states, infection, and stroke contribute substantially to morbidity and mortality.^{1,4,5} Generating institution-specific data on clinical profile, causes, and short-term outcomes is therefore important for triage, timely etiological evaluation, and rational resource allocation. The present study was undertaken to analyse the outcome of unconscious patients presenting to the emergency department of a tertiary care hospital.

OBJECTIVES

- To study the clinical profile of unconscious patients presenting to the emergency department.
- To study the etiological distribution of unconscious patients presenting to the emergency department.
- To study the final outcome of unconscious patients presenting to the emergency department.

METHODS

This was a hospital-based prospective observational study conducted in the Department of Emergency Medicine, Muzaffarnagar Medical College and Hospital, a tertiary care referral center in Uttar Pradesh, India.

A total of 100 consecutive patients presenting in an unconscious state with $GCS \leq 8$ were included. Patients with traumatic causes, age below 5 years, and known dementia, delirium, or irreversible brain damage were excluded.

After informed consent from the legally authorized representative, demographic details, history, vital parameters, general examination, detailed neurological examination, and systemic examination findings were recorded. Laboratory investigations included complete blood count, liver and kidney function tests, arterial blood gas analysis, and serum electrolytes. Lumbar puncture and computed tomography of the head were performed when clinically indicated according to institutional protocols. All patients were managed by the treating emergency team as per standard care.

Patients were followed for 7 days from admission. Final outcome was classified as improved, no improvement, or death. Data were entered into a master chart and analyzed using SPSS software and StatCalc. Descriptive statistics were expressed as mean \pm standard deviation or frequency (%). Associations were tested using appropriate significance tests, and $p < 0.05$ was considered statistically significant.

RESULTS

The mean age of the study population was 51.41 ± 19.71 years (range, 18–85 years). Patients aged more than 40 years constituted 68% of the cohort. Females accounted for 58% of cases, and 57% of patients were referred from another facility. At presentation, 50% had GCS 3–5 and 50% had GCS 6–8, while

abnormal pupils were recorded in 54%. All patients required intensive care unit admission and ventilatory support, and 73% had hospital stay longer than 7 days (Table 1).

Hypoxic causes (23%) were the most frequent etiology of unconsciousness, followed by metabolic causes (21%), central nervous system infection (15%), stroke (14%), other causes (16%), and poisoning (11%) (Table 2).

At 7-day follow-up, 59% of patients improved, 21% had no improvement, and 20% died (Table 3). Outcome was significantly associated with admission GCS subgroup and pupil status. Patients with GCS 3–5 had higher mortality than those with GCS 6–8 (28% vs 12%), and patients with abnormal pupils had markedly higher mortality than those with normal pupils (29.6% vs 8.7%) (Tables 4 and 5). Prolonged hospital stay was also associated with adverse outcome (Table 6).

DISCUSSION

The present prospective observational study evaluated 100 patients with non-traumatic unconsciousness presenting to a tertiary care emergency department. The cohort was predominantly middle-aged and elderly, with a mean age of 51.41 ± 19.71 years, and 68% of patients were older than 40 years. This age pattern is comparable with adult non-traumatic coma literature. Kafle et al. reported a mean age of 54.5 ± 19 years in intensive care unit patients with non-traumatic coma.⁴ The predominance of older patients is clinically relevant because advancing age is frequently accompanied by cerebrovascular disease, systemic infection, metabolic derangement, and cardiorespiratory compromise, all of which can precipitate severe depression of consciousness.^{5,13,14}

Females constituted 58% of the present cohort, whereas several emergency and neurological series have shown male predominance. Kafle et al. reported a higher proportion of men in non-traumatic coma, and Shrestha et al. similarly described predominance of male presentations in a tertiary neurological emergency setting.^{4,17} This difference may reflect local referral patterns, sociocultural factors, or case-mix variation rather than a true biological difference. More than half of our patients were referred from peripheral centers, which supports the role of tertiary hospitals as referral hubs for critically ill unconscious patients.¹⁷

Hypoxic and metabolic causes were the leading etiologies in the present study, together accounting for 44% of cases, followed by central nervous system infection and stroke. This broad etiological spectrum is consistent with other adult altered sensorium and non-traumatic coma studies. Sharifi et al. and Sudhir et al. emphasized that non-traumatic loss of consciousness in the emergency department arises from heterogeneous neurological, metabolic, infectious, and toxicological causes.^{1,2} Kafle et al. and Si Larbi et al. also identified metabolic and vascular causes among the major etiologies of adult non-traumatic coma.^{4,5} In contrast, Kumar et al. reported stroke as the single most common cause, accounting for 49.3% of comatose adults, with metabolic causes contributing 28.6%.⁷ Such variation across studies probably reflects differences in referral bias, case definition, and ICU versus emergency department populations. The contribution of CNS infection in our series is also clinically meaningful and aligns with reports highlighting encephalitic and encephalopathic illnesses as important contributors to severe altered sensorium.^{13,18}

Outcome analysis in the present study showed that 59% of patients improved, 21% had no improvement, and 20% died by day 7. This mortality burden confirms the seriousness of non-traumatic unconsciousness even under intensive care. The mortality observed in our study was lower than that reported by Si Larbi et al., who found an overall mortality of 41.6% among adults with non-traumatic coma admitted to the ICU.⁵

The comparatively lower mortality in the present study may relate to mixed etiologies with a meaningful proportion of potentially reversible hypoxic, metabolic, and toxic causes, together with early intensive care and ventilatory support. The relatively favorable outcome in poisoning and metabolic conditions in our cohort is in keeping with the general principle that rapidly reversible systemic causes have better short-term outcomes than structural or irreversible neurological causes.^{7,14}

Admission neurological severity remained the most clinically useful predictor of short-term outcome. Patients with GCS 3–5 had substantially worse outcomes than those with GCS 6–8, with higher mortality and non-improvement rates. This observation is consistent with prior literature. Batool et al. identified low GCS as an important determinant of outcome in adults with altered mental status.⁶ Similar prognostic importance of low GCS has been reported in stroke cohorts by Luqman et al. and Ranasinghe et al.^{8,10} in acute encephalopathy by Dhar et al. and Tangpaisarn et al.^{13,14} and in pediatric non-traumatic coma by Anik et al.¹⁵ Although the narrow inclusion range of severe GCS scores may reduce discrimination when analyzed as a continuous variable, categorical GCS grouping remained clinically meaningful in the present study.

Pupil status also showed a strong association with outcome. Patients with abnormal pupils had markedly higher mortality than those with normal pupils. This finding is biologically plausible because pupillary abnormalities often indicate brainstem dysfunction, raised intracranial pressure, or severe diffuse cerebral injury. The prognostic relevance of pupil findings has been emphasized by Anik et al. in non-traumatic coma and by Peluso et al. in neurological prognostication after cardiac arrest.^{15,16} Therefore, bedside pupillary examination remains an essential component of early emergency assessment.

Stroke accounted for 14% of unconscious presentations in the present series. Although not the most frequent cause, it remains an important contributor because cerebrovascular disease is consistently associated with severe neurological impairment and poor outcome. Studies by Kurmi et al., Luqman et al., and Ranasinghe et al. have all highlighted altered consciousness and poor neurological grade as markers of adverse prognosis in stroke.⁸⁻¹⁰ Hypertensive neurological emergencies may also contribute to unconscious presentations, as shown by Goswami and Nanda, who reported frequent neurological manifestations and higher mortality in hypertensive emergencies.¹¹ In addition, electrolyte imbalance and other metabolic disturbances continue to be relevant because they can function both as causes and consequences of unconsciousness; this has been highlighted by Naveed et al.¹²

Overall, the present study supports an integrated bedside approach to prognostication in unconscious patients. Demographic factors alone were less informative than neurological severity indicators. Early triage based on GCS subgroup, pupillary response, rapid etiological work-up, and aggressive supportive management remains essential for improving short-term outcomes in this high-risk emergency population.^{5,6,13-16}

CONCLUSION

Non-traumatic unconsciousness is a major emergency presentation associated with substantial morbidity, prolonged hospitalization, and considerable mortality. Hypoxic and metabolic causes constituted the largest etiological groups in the present study, followed by central nervous system infection and stroke. At 7 days, one-fifth of patients had died. Lower GCS subgroup and abnormal pupil status were significantly associated with adverse outcomes and remain useful bedside prognostic markers. Prompt etiological evaluation, early critical care support, and careful neurological assessment are essential to improve short-term outcomes in unconscious patients presenting to the emergency department.

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TABLES

Table 1. Baseline demographic and clinical profile of the study population (N = 100)

Variable	Category	Value
Age	18–40 years	32 (32%)
	41–60 years	34 (34%)
	>60 years	34 (34%)
Gender	Male	42 (42%)
	Female	58 (58%)
Mode of arrival	Direct	43 (43%)
	Referred	57 (57%)
GCS	3–5	50 (50%)
	6–8	50 (50%)
Pupil status	Normal	46 (46%)
	Abnormal	54 (54%)
ICU admission	Yes	100 (100%)
Ventilator support	Yes	100 (100%)
Hospital stay	≤7 days	27 (27%)
	>7 days	73 (73%)

Table 2. Etiological distribution of unconsciousness (N = 100)

Etiology	Number	Percentage
Hypoxic	23	23%
Metabolic	21	21%
Central nervous system infection	15	15%
Stroke	14	14%
Others	16	16%
Poisoning	11	11%
Total	100	100%

Table 3. Distribution according to Outcome at 7 days (N = 100)

Outcome	Number	Percentage
Improved	59	59%
No improvement	21	21%
Death	20	20%
Total	100	100%

Table 4. Association between GCS subgroup and 7-day outcome

GCS subgroup	Improved	No improvement	Death	Total
3–5	21(42%)	15(30%)	14(28%)	50(100%)
6–8	38(76%)	6(12%)	6(12%)	50(100%)
Total	59(59%)	21(21%)	20(20%)	100(100%)

Chi-square test: statistically significant ($p < 0.05$).

Table 5. Association between pupil status and 7-day outcome

Pupil status	Improved n (%)	No improvement n (%)	Death n (%)	Total
Normal	37 (80.4%)	5 (10.9%)	4 (8.7%)	46 (100%)
Abnormal	22 (40.7%)	16 (29.6%)	16 (29.6%)	54 (100%)
Total	59 (59%)	21 (21%)	20 (20%)	100 (100%)

Chi-square test: statistically significant ($p < 0.05$).

Table 6. Association between hospital stay duration and 7-day outcome

Hospital stay	Improved n (%)	No improvement n (%)	Death n (%)	Total
≤7 days	21 (77.8%)	4 (14.8%)	2 (7.4%)	27 (100%)
>7 days	38 (52.1%)	17 (23.3%)	18 (24.7%)	73 (100%)
Total	59 (59%)	21 (21%)	20 (20%)	100 (100%)

Chi-square test: statistically significant ($p < 0.05$).