

Original Research

Causes and Outcome of Unconsciousness in the Accident and Emergency Department of the University of Port Harcourt Teaching Hospital

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Abstract

Background: Unconsciousness occurs when a patient enters a sleeplike state but cannot be aroused, and it is not due to physiological drowsiness. It is a common presentation in the Accident and Emergency Department (A&E), and a burden to the emergency physician especially when the cause is unknown. The cause of coma may be trauma or non-trauma related. There is a shortage of data on the aetiology and outcome of unconsciousness in developing countries including Nigeria.

Methodology: This cross-sectional study investigates 765 unconscious patients using convenience sampling from September 2023 to June 2024 at the A&E of the University of Port Harcourt Teaching Hospital. The World Health Organization emergency unit form was adapted for this study.

Results: The total population of this study is 765, 55.16% males and 44.84% females. A majority of the cases 81.83% were not related to trauma. The commonest causes of unconsciousness were stroke, diabetic complications & emergencies, traumatic brain injury, metastatic neoplasm, HIV AIDs related disease and hypertensive emergency. Most of the patients 494(64.58%) died while in A&E, 116 (15.16%) were transferred to the ward and 56 (7.58%) were discharged against medical advice.

Conclusion: Unconscious patients are a challenge in the emergency room. Stroke and diabetic emergencies are the commonest causes of non-trauma-related aetiologies while traumatic brain injury is the most common cause of trauma-related aetiology of unconsciousness.

Keywords: *Altered Mental State; Stroke; Traumatic Brain Injury; Diabetic Emergency.*

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How to cite: Buowari DY, Ikpae BE. Causes and Outcome of Unconsciousness in the Accident and Emergency Department of the University of Port Harcourt Teaching Hospital. Niger Med J 2024;65(6):984-994. <https://doi.org/10.60787/nmj.v65i6.579>.

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Introduction:

Timely and immediate medical care is rendered to acutely ill patients and the injured in the Accident and Emergency Department (A&E).¹ It is common for the emergency physician to attend to patients with altered consciousness.²⁻⁴ Unconsciousness occurs when a patient enters a sleeplike state but cannot be aroused, and it is not due to physiological drowsiness.^{4,5} It is a reflection and a necessary pointer to the state of function of the brain³. When a patient is unconscious, there is no awareness of the environment.^{6,7} Though unconsciousness is a common presentation in the A&E, the precise cause and aetiology are sometimes unknown.^{2,8} The exact prevalence of unconsciousness is unknown as it varies between hospitals.⁹ It is 5% of patients admitted into the A&E in the USA¹⁰ and 20-59% of medical causes at Ibadan, Nigeria.¹¹ The management of the unconscious patient is a burden to the emergency physician^{10,12} as it signifies a condition that is life-threatening and needs urgent attention.^{4,5} Emergency physicians are sometimes challenged when they have to provide medical care to unknown unconscious patients.¹³ One of the challenges is that the history must be gotten from someone else which sometimes may not be reliable. Also, the history may be unknown. Some unconscious patients have non-specific symptoms; therefore, they require prompt evaluation and management to decrease the morbidity and mortality associated with it.^{14,15}

There are several causes of unconsciousness which sometimes may differ from the different health facilities. The causes of coma are both structural and biochemical (metabolic) derangement, which results from increased intracranial pressure, bleeding, and toxin accumulation in the brain. The injury caused can either be temporary and reversible or may be permanent.⁷ The cause of coma may be due to trauma or non-trauma related. Other causes of unconsciousness are systemic infections^{4,16}, metabolic derangements^{4,17}, stroke^{5,16,17}, toxins¹⁷, status epilepticus⁶ and kidney diseases. Sometimes it may be difficult to make a definitive diagnosis.^{14,15} Psychiatric disturbances can be considered in patients when other organic causes and malingering have been excluded.¹⁴

It is necessary to recognise the exact cause of unconsciousness.⁵ At presentation, the level of unconsciousness of the patient is assessed usually using the Glasgow coma scale (GCS).¹⁸ Also, a thorough physical examination is performed. This assessment will necessitate the identification of any neurological complications and institute the necessary interventions.¹⁸ Although the unconscious patients may be a minority in the A&E, they consume a lot of the resources.^{10,19} The outcome of unconsciousness is dependent on the available local resources hence there is a need for strategies to enable standardization.¹⁹ Unconsciousness is a poor prognostic factor for patients because it may be fatal though not always.¹⁵ The management of unconscious patients depends on the available human and material resources, and protocols which are usually challenged in the absence of standardization.²⁰ This is a challenge in developing countries like Nigeria.

In a study conducted in Singapore, 11% of the unconscious patients died.¹² In a Nigerian study conducted at Nnewi, eastern Nigeria, the commonest cause of unconsciousness not due to trauma was stroke 52.2%, metabolic causes 18.9% and 18% infections.¹⁷ There was a high death rate of 55.9% and diabetes accounted for 18% of the unconscious patients. The predominant infective causes were meningitis and HIV-related disease.¹⁷

There is a dearth of data on the etiologies, management and outcome of unconscious patients in the A&E especially in Africa and other low and middle-income countries (LMIC).^{5,16,19} This may be due to obsolete medical equipment, shortage of manpower and lack of modern medical equipment that facilitates medical imaging, diagnosis and resuscitation. It is worse with unknown unconscious patients.²⁰ This study aims to determine the causes of unconsciousness and its outcome at the A&E of the University of Port Harcourt Teaching Hospital (UPTH), Nigeria.

Methodology

Study Design

This is a cross-sectional study conducted at the A&E of the University of Port Harcourt Teaching Hospital (UPTH), located in Port Harcourt, southern Nigeria. The STROBE checklist for cross-sectional studies was adhered to.

Study Area

The A&E of UPTH provides medical care only to individuals aged 18 years and above with non-traumatic problems and all trauma cases irrespective of their age except outpatients with burns. This is because there is a regional burns Centre located within the hospital. All patients with burns go directly to the burns Centre. There is also a children's emergency ward (CHEW) that attends to persons aged 17 years and below. Patients presenting at the A&E are first attended to by the emergency physicians' working in the A&E before they are referred to other specialist teams as needed. Within 48 hours they are expected to be transferred out of the A&E to the wards, ICU, or operating room to give room for bed space to admit new patients. The UPTH A&E has four lying-in bays namely the resuscitation area, male and female lying-in bay, and a trauma ward with a total of 36 beds. When a patient arrives at the A&E, the doctor on duty attends to the patient first. Then, if necessary, after resuscitation, another specialist team is invited to continue the management. The population of this study are unconscious patients presenting at the A&E of UPTH.

Study Population

The study population are unconscious patients who are presented at the A&E of UPTH. The inclusion criteria are patients who are unconscious evidenced by the Glasgow Coma Scale less than 14/15. Conscious patients who were alert were excluded from this study. Patients with infectious notifiable diseases and aggressive and violent companions were excluded from the study. The research ethics committee of UPTH approved the study.

Study Instrument

The World Health Organization (WHO) emergency unit form was adapted to the study setting.

Method of Data Collection

Data was collected from September 2023 to August 2024. Consent was obtained from the patients' companions because the patients were unconscious and could not give consent. Unaccompanied patients were automatically recruited into the study as participation in the study was not detrimental to them. The generated data was entered into an Excel spreadsheet, cleaned and exported into Social Package for Social Sciences version 21 (SPSS) for analysis. Chi-square was used to determine the relationship between the Glasgow coma scale and outcome.

Results

This study's total number of patients was 765, comprising 422 (55.16%) males and 343 (44.84%) females. The age range of patients was 1 year to 95 years. The number of cases related to trauma were 139 (18.17%) while in 626 (81.83%) the cause of the unconsciousness was not associated with trauma.

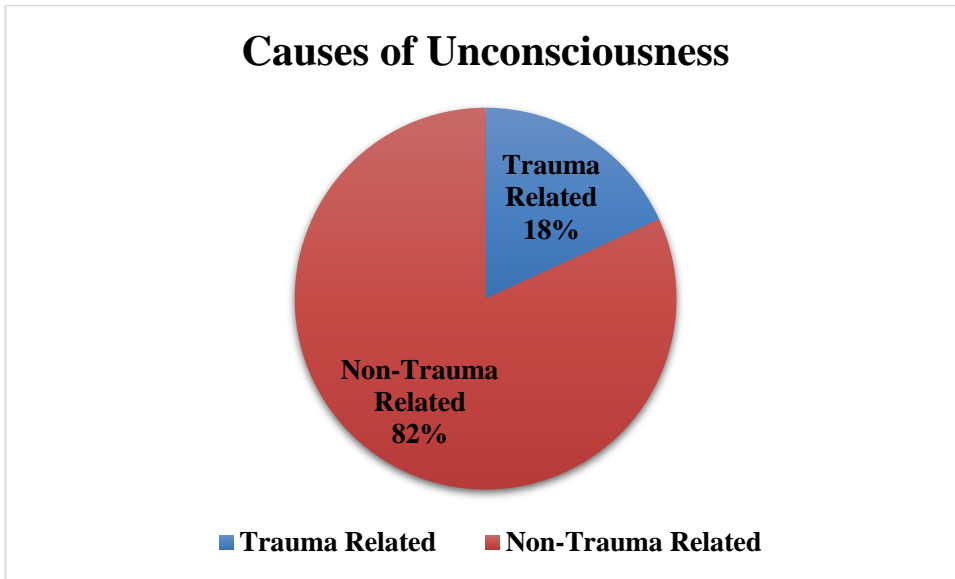


Figure 1: Causes of Unconsciousness

Diagnosis

Eleven (1.48%) patients died during urgent preliminary care and assessment hence no diagnosis was made. Some of the patients 5(0.65%) of the patients were already bedridden at home and had already developed pressure ulcers (decubitus ulcers) before they were brought to the A&E unconscious. The table 1 shows the cause of the unconsciousness, however, some patients had more than one diagnosis.

Table 1: Causes of Unconsciousness

S/N	Diagnosis	Female N (%)	Male N (%)	Total	Percent (%)
1.	Stroke	133(45.08)	162(54.92)	295	37.34
2.	Traumatic Brain Injury	25(20.33%)	98(79.67%)	123	15.57
3.	Diabetic Emergency/Complication	57(55.88%)	45(44.12%)	102	12.91
4.	Metastatic neoplasm (Cancer)	31(57.41%)	23(42.59%)	54	6.84
5.	HIV AIDS Related Disease	19(55.88%)	15(44.12%)	34	4.30
6.	Renal Failure [(Acute Kidney Injury (AKI)/chronic kidney disease (CKD)]	9(40.91%)	13(59.09%)	22	2.78
7.	Other Injuries	4(18.18%)	18(81.82%)	22	2.78
8.	Meningitis	8(40.00%)	12(60.00%)	20	2.53
9.	Diseases of the Digestive System	11(64.71%)	6(35.29%)	17	2.15
10.	Other Diseases of the Nervous System	8(53.33%)	7(46.67%)	15	1.90

11.	Hypertensive Emergency	7(50%)	7(50%)	14	1.77
12.	Other diseases of the Circulatory System	8(61.54%)	5(38.46%)	13	1.65
13.	Unconsciousness of Unknown Origin	9(75.00%)	3(25.00%)	12	1.52
14.	Tuberculosis	4(57.14%)	3(42.86%)	7	0.89
15.	Other infections	3(50.00%)	3(50.00%)	6	0.76
16.	Non-diabetic hypoglycaemia	3(60.00%)	2(40.00%)	5	0.63
17.	Poisoning	2(40.00%)	3(60.00%)	5	0.63
18.	Diseases of the Respiratory System	2(40.00%)	3 (60.00%)	5	0.63
19.	Surgical Abdomen	3(75.00%)	1(25%.00)	4	0.51
20.	Sepsis	1(25.00%)	3(75.00%)	4	0.51
21.	Others	6(54.55%)	5(45.45%)	11	1.39
	Total			790	100

Some patients had more than one diagnosis. Table 1 also highlights that most of the patients had non-communicable diseases and some other infections. Some of the patients with trauma had more than one type of injury as they had multiple injuries. The diabetic emergencies are diabetic nephropathy, hyperglycemia, drug-induced hypoglycaemia, diabetic ketoacidosis, hyperglycemic hyperosmolar state, and diabetic foot ulcer disease. The diseases grouped under renal failure are acute kidney injury and chronic kidney disease. These patients had uraemia, Uraemic encephalopathy and Uraemic gastritis. The HIV AIDS-related diseases are HIV encephalopathy and HIV-associated nephropathy (HIVAN). Diseases categorized as other diseases of the nervous system are acute Confusional state, syncope, and status epilepticus. Diseases categorized as diseases of the digestive system are gastroenteritis, chronic liver disease and gastrointestinal bleeding. Diseases categorized as other diseases of the circulatory system are heart failure, pulmonary embolism, and pulmonary oedema. Diseases categorized as diseases of the respiratory system are chronic obstructive pulmonary disease, acute respiratory distress syndrome and pneumonia. Diseases categorized as other infections are cellulitis, gas gangrene, Ludwig's angina, facial space infection and toxic epidermal necrosis. Diseases categorized as others are immunosuppression, post-traumatic distress disorder, attempted suicide, Cauda equina syndrome and drug toxicity. The poisoning in this study was due to carbon monoxide, organophosphate and chemicals.

Metastatic neoplasms were also responsible for unconsciousness as shown in table 2. Table 2 shows that the commonest cause of metastatic neoplasm causing altered mental state was breast cancer in females and carcinoma in males. One male patient had both breast and prostate cancer.

Table 2: Metastatic Neoplasm Causing Unconsciousness

S/N	Type Of Cancer	N=54	Percent
1.	Breast	16	29.63
2.	Prostate	11	20.37
3.	Brain	7	12.96
4.	Colorectal/Intra-Abdominal	6	11.11
5.	Bronchogenic (Lungs)	3	5.56
6.	Cervical/female Genital Tract	2	3.70
7.	Liver	2	3.70
8.	Larynx	1	1.85
9.	Leukaemia	1	1.85
10.	Hodgkin's Lymphoma	1	1.85
11.	Rhabdomyosarcoma	1	1.85
12.	Skin	1	1.85
13.	Gastric	1	1.85
14.	Synovial osteosarcoma	1	1.85

The outcome of unconscious patients seen during the study is as shown in table 3.

Table 3: Outcome of the Unconscious Patient

S/N	Outcome	N	Percent (%)
1.	Died	494	64.58
2.	Transferred to the Ward	116	15.16
3.	Discharge against medical advice	58	7.58
4.	Transferred to ICU	41	5.36
5.	Abscond	28	3.66
6.	Discharged Home	23	3.01
7.	Transferred to the operating theatre	5	0.65
	Total	765	100

Table 3 shows that 494 (64.58%) of the patients died while they were still in the A&E while 116 (15.16%) were transferred to the wards depending on the diagnosis, the ICU or theatre for emergency surgery. For patients, whose companions signed against medical advice 58 (7.58%), Table 4 shows the reason for the decision to sign against medical advice.

Table 4: Reason for Discharge against Medical Advice (DAMA) and Person that signed the DAMA Form

S/N	Reason for DAMA	Frequency N=58	Percent %
1.	Improved clinical state as the patient is now conscious	19	32.76
2.	No reason	16	27.59
3.	The patient is not improving	10	17.24
4.	Financial constraints	6	10.34
5.	To stay close to family in another town	3	5.17
6.	The daughter is a nursing mother	1	1.72
7.	To go to a private hospital	1	1.72
8.	To seek spiritual help	1	1.72
9.	Instruction from in-laws	1	1.72
	The person that Signed the DAMA Form		
1.	Children	21	36.21
2.	Patient	10	17.24
3.	Spouse	7	12.07
4.	Sibling	7	12.07
5.	Parents	6	10.34
6.	Landlady	1	1.72
7.	Cousin	1	1.72
8.	Master	1	1.72
9.	Friend	1	2.33
10.	Classmate	1	1.72

11.	Community brother	1	1.72
12.	The patient's daughter refused to sign as the patient who is now conscious is not literate	1	1.72
	Total	58	100

Table 4 shows that 19 (32.76%) discharged themselves or the request made by their caregiver/relative against medical advice as the patient has improved clinically since the patient became conscious. Concerning the level of consciousness for patients discharged against medical advice, 28(48.28.2%) were conscious while 30(51.72%) were unconscious at the time the decision was made. For patients that absconded or were taken away from the A&E by their caregivers without informing the A&E staff, 17 (60.71%) had become conscious while 11 (39.29%) were still unconscious at the time the patient was taken away from the A&E by their companions without informing the nurses of doctors on duty.

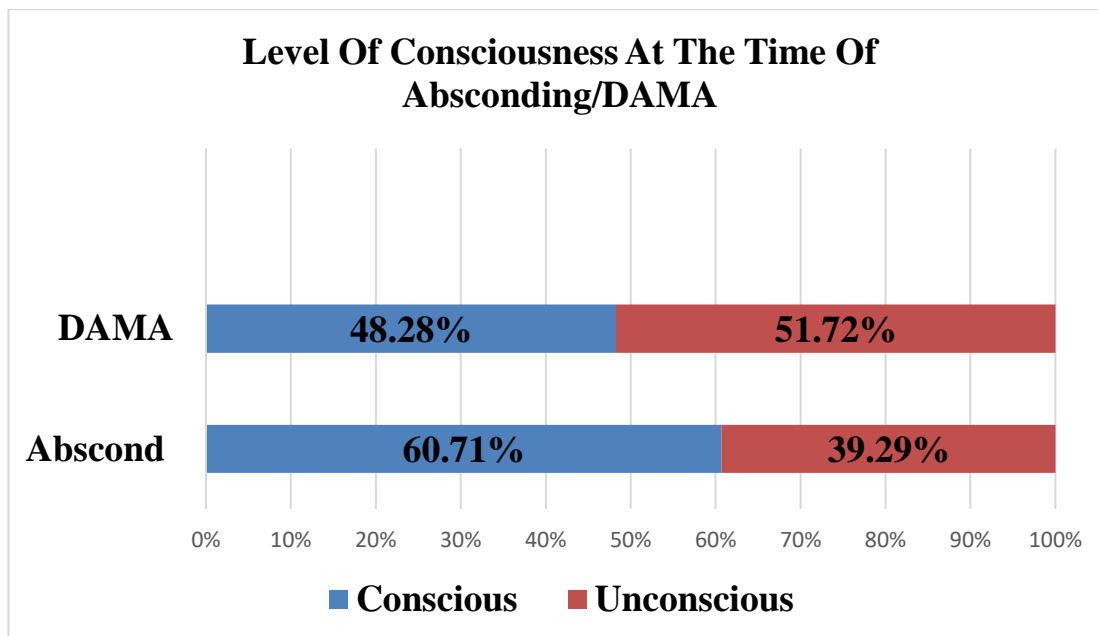


Figure 2: Level of Consciousness at the Time of Absconding/Discharge Against Medical Advice

Discussion

This study highlights that the unconscious patient is a burden to the health care system in Nigeria and the A&E. There is also a wide variety of the aetiology of unconsciousness in the A&E^{5,20} as seen in this study.

There is a high fatality rate of unconsciousness in the A&E.^{5,8} The high mortality of 64.9% seen in this study is like the trend of other Nigerian studies though higher than the 55.9% from Nnewi¹⁷, 48.9% by Owolabi et al¹⁶ in Northwestern Nigeria and lower than 92% reported by Kayode-Iyasere et al from Benin²². The high rate of mortality is also reported from other countries in Africa as shown in study by Mohammed et al from Ethiopia with a rate of 52.8%. These mortality rates are far higher when compared with that of more resourced countries as shown by a study in Singapore¹² with a rate of 11% and other studies^{8,10,20,21} from more resourced countries that recorded a lower death rate. A review of the mortality rates indicates poor outcomes in unconscious patients in Nigeria and low resource settings. This may be due to the lack of sophisticated emergency services in Nigeria coupled with the non-availability of

modern medical diagnostic equipment within the A&E. Other differences in the comparison of results are the fact that this index study had both traumatic and non-traumatic cases of coma compared to the other Nigerian studies which were not emergency room studies. In addition, late presentation and deep coma has been shown to be a poor prognostic factor among patients in coma as Nwani et al⁷ showed that patients with a GCS ≤ 6 have a poorer prognosis. This is because deep coma represents an advanced stage of the disease, and it also adds burden to the initial ailment.⁵ The results of this study and others from Nigeria indicates the need for an improvement in the medical infrastructure especially emergency and ambulance services¹¹ to facilitate prompt arrival at hospitals. In addition, the need to improve access to life support and ventilation in patients with coma should be prioritized. The pattern of aetiology of coma in this study showed that non trauma causes were most common. This is like a studies conducted in eastern Nigeria where most of the patients with altered mental states were not related to trauma^{16,17} A similar observation was reported from another study conducted in Somalia.⁵ This calls for improved planning for the care of non-traumatic causes of unconsciousness in our emergency rooms with the provision of facilities such as brain imaging for prompt diagnosis of stroke.

Most of the diagnoses were made by the initial history and physical examination while awaiting requested confirmatory test limited by delayed or non-payments by the patient companions. Brain imaging at the time of this study was about 65 United States Dollars (65,000 naira the Nigerian currency) in Port Harcourt which every patient with stroke and traumatic brain injury is expected to do. Most patients pay out of pocket as only a few patients are enrolled in any form of health insurance hence patient companions/relatives will have to pay out of pocket. Therefore, mechanisms to improve access to required investigations for patients in the emergency room is advocated.

The history obtained from the patient's companions and physical examination was enough to make a diagnosis in a good number of cases. Although sometimes the history may not be reliable especially if the patient was found alone unconscious in a room. Most challenging are the unnamed unknown patients who did not have any form of trauma.

This above situation of the unnamed unknown unconscious patient and lack of access to investigations resulted in the inability to establish a final diagnosis in some patients. This is not new as other studies have also identified unconsciousness of unknown origin.²⁰ Diabetic emergencies, HIV-related diseases and meningitis were common causes of altered mental state. The most common infections leading to altered mental state in this study were HIV AIDs-related disease and meningitis. This is comparable to other studies.^{6,11} Some patients had more than one aetiology and disease. Most of the causes of unconsciousness are not related to trauma²¹ as seen in this study with stroke being the most common non trauma cause of unconsciousness. This is in keeping with other studies conducted in both developing countries including Nigeria^{11,17} and developed countries.^{8,12,20,21}

In this study, more males were unconscious. There is no difference in previous studies conducted in Asia^{2,8}, and Ethiopia but it contrasts to the study conducted in Somalia¹⁹ which had more females.

Patients are expected to stay in the A&E for 24-48 hours and then transferred to other wards including the intensive care unit (ICU) depending on the availability of bed space. It is not surprising that some patients and their companions discharged themselves against medical advice when the patient became conscious. The commonest being improved clinical state, the patient not improving as the patient was still unconscious at the time of DAMA form was signed and financial constraints.

Cancer is also an etiology of unconsciousness especially when there is metastasis to the brain. The most common cancer seen in this study was breast and prostate cancer.

Conclusion

Physicians will be challenged with unconscious patients and the identity of some may not be known. The commonest cause of unconsciousness in this study was not related to trauma. Severe traumatic brain injury was the most common cause of trauma-related unconsciousness due to trauma while stroke and diabetic emergencies were the most common cause of non-trauma-related unconsciousness. There was a high mortality among unconscious patients in this study. The study outcomes indicate the urgent need to improve emergency room services through multifactorial approaches that include medical education, death audits and emergency services planning based on the results of such studies.

Limitation

This study was conducted at the A&E of UPTH hence it may not be a true reflection of the causes and outcome of unconsciousness in other Nigerian hospitals. Also, since it is a hospital-based study it may not give the true reflection of the causes and outcome of unconsciousness in the region as some patients may not present at A&E.

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