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An examination of the etiology, clinical characteristics, and prognosis of coma patients receiving tertiary care

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Abstract

Background and Objectives: To study the physical traits, prognoses, and etiology of coma patients.

Methods: A prospective observational experiment was conducted, including all 60 subjects with a (GCS) score of less than 10 who presented in the hospital.

Results: Male mortality (n=29/33) exceeds female mortality (n=25/27) due to men experiencing work-related stress, lifestyle changes, and dietary habits earlier. Patients who had a (GCS) score of less than 5 had a mortality rate of 100%. Out of the 29 patients with a GCS score of 5 to 7, only 5 survived. It signifies adverse outcomes and decreased GCS scale.

Conclusion: There is no statistical correlation between age, gender, and performance. The majority of individuals were over the age of 40. Intracranial causes were the primary factors contributing to the majority of deaths. The patients with hyponatremia and neuroinfection showed positive outcomes. Hypertension was the most prevalent comorbidity, followed by type 2 diabetes. Patients with chronic renal illness who had a (GCS) score below 10 experienced a mortality rate of 100%. A (GCS) score of less than 5 resulted in a death rate of 100%. Poor outcomes were observed due to atypical respiration and absence of pupil reflexes.

Keywords: Coma, mortality, aetiology, comorbidities, reflexes

Introduction

Coma is a critical condition that necessitates prompt medical decision-making upon arrival to the emergency department or intensive care unit (ICU). Coma, which can arise from several causes and poses a serious risk to life, offers a formidable task for emergency or critical care doctors. Approximately 5% of patients arrive at the emergency department with an impaired mental state, while 1% of admissions to the emergency department are attributed to coma. Coma is a common reason for being admitted to the ICU. While there is no unanimous agreement on the exact threshold for defining coma, typically a Glasgow Coma Scale (GCS) score below 10 points is utilized. Coma, in the absence of a traumatic incident, is a concomitant manifestation of various illnesses, including acute sepsis, poisoning, and hepatic encephalopathy. The coma resulting from these diseases might be lethal if it is not diagnosed or treated properly^[1-3].

Typically, while diagnosing a coma, the first step is to distinguish between traumatic and non-traumatic coma (NTC). Nevertheless, identifying the underlying etiology of NTC is a significant problem for medical practitioners. To provide appropriate treatment choices for individuals with NTC, it is crucial to distinguish its underlying cause. A crucial initial distinction should be drawn between the structural causes and non-structural causes of NTC using a computer tomography (CT) scan. Structural coma may result from conditions such as cerebral infarction, intracranial hemorrhage, intracranial malignancy, and central nervous system infection, such as encephalitis or abscess. Non-structural coma encompasses coma caused by poisoning, epilepsy, infections outside the brain, circulatory shock, post-anoxic events, cardiac arrest, respiratory failure, metabolic issues (such as low blood sugar, imbalances in electrolytes and acid-base levels, and hypothermia), hepatic encephalopathy, and uremic encephalopathy^[4-6].

Neuroimaging investigations are typically unnecessary for diagnosing the majority of medical causes of coma. Medically induced comas account for 90% of non-traumatic comas. Most often, basic therapy is beneficial. Coma is a perilous state that necessitates urgent medical intervention in an intensive care unit (ICU).

Coma is a complex illness that can arise from various etiologies. Altered sensorium is seen in 5% of patients in the emergency room. Coma is present in 1% of admissions. CT scans differentiate between the structural and non-structural causes of nontraumatic coma (NTC) [7-9].

Materials and Methods

This prospective observational study included all 60 consecutive adult patients who visited Department of psychiatry, Sambhram Institute of Medical Sciences, Kolar, Karnataka, India from November 2018 to October 2019 with a Glasgow Coma Scale (GCS) score of less than 10. Patients are admitted if their (GCS) score is 10 or lower upon arrival. During the presentation, a comprehensive history was taken, a thorough clinical examination was conducted, vital signs were recorded, and random blood sugar readings were obtained.

Inclusion criteria

- Individuals aged 18 to 65
- GCS of less than 10 in people

Exclusion criteria:

- Women who are pregnant or nursing; • People 65 years of age and older.
- Coma brought on by trauma.
- Individuals who decline to take part.

Results

Table 1: Gender distribution

Gender	No. of patients
Male	33 (55%)
Female	27 (45%)

Table 2: Total number of patients with comorbidities

S. No	Comorbidities	No. of patients
1	Chronic kidney disease(CKD)	12
2.	Systemic lupus erythromatosis(SLE)	4
3.	Type 2 Diabetic mellitus	28
4.	Hypertension	32
5	Cardiovascular accident	9
6	Coronary artery disease	7
7	Gloima	0
8	Tuberculoma	0

Table 3: Patients with various coma aetiologies.

S. No	Etiology for poor GCS	No. of patients
1.	Cerebrovascular events	27 (45%)
1a.	Hemorrhagic stroke	16(26.7%)
1b.	Ischemic stroke	11(18.3%)
2.	Metabolic encephalopathy	19 (31.7%)
2a.	Hypoxemic Ischemic encephalopathy	5(8.4%)
2b.	Hyponatremia	7(11.7%)
2c.	Hypertensive encephalopathy	2(3.4%)
2d.	Hypoglycemic encephalopathy	1(1.7%)
2e.	Hyperglycemic encephalopathy	1(1.7%)
2f.	Diabetic Ketoacidosis	3(5%)
3.	Infective etiology	7(11.7%)
3a.	Septic encephalopathy	5(8.4%)
3b.	Meningoencephalitis	2(3.4%)
4.	Status epilepticus	4(6.7%)
5.	Alcholic Intoxication	1(1.7%)
6.	Organophosphorous poison	2(3.4%)
7.	Total	60 (100%)

The primary factor leading to delayed medical attention and subsequent presentation as a coma among illiterate individuals was a lack of awareness about the issue.

In the elder age group (> 40 years old), the fatality rate is greater, with 49 out of 60 patients, or 75.5% (n=33), experiencing fatalities. There is a correlation between risk factors and ageing, which leads to elevated mortality rates.

Male mortality has a greater rate (n=27/37) compared to female mortality (n=22/33) due to men encountering work-related stress and alterations in lifestyle and dietary habits at an earlier stage than women.

Among the causes of increased mortality, Type 2 diabetes is second most common (n=16/26), whereas hypertension is the most prevalent cause (n=21/31). All patients diagnosed with Chronic Kidney Disease (CKD) have a mortality rate of 100%. Cerebral vascular accidents (n=21/28) are the primary cause of death in coma patients, followed by metabolic encephalopathy (16/23). The supplementary causes were illness (5 out of 10 cases), status epilepticus (1 out of 6 cases), alcohol intoxication (1 out of 2 cases), and organophosphorous poisoning (0 out of 1 case).

Discussion

Conducting a comparative analysis of the age distribution in non-traumatic comas in relation to existing Indian and worldwide studies. Out of the total of 60 patients included in this study, 50 of them are aged 50 or above. Another study conducted at Karolinska University Hospital in Stockholm, Sweden from 2003 to 2005 focused on the prognosis of individuals diagnosed with non-traumatic coma. The participants in this study had a mean age of 59 years, ranging from 15 to 98 years. Consistent with the previously mentioned study, the average age at which our examination was conducted was 47.10+13.06 [10].

A study was undertaken at the Goa Medical College and Hospital in Goa to investigate the clinical characteristics, etiology, and prognosis of non-traumatic coma in a sample of 100 patients, consisting of 68 males and 32 females. A prospective observational study involving 80 patients, of which 59 were male, was undertaken at Gauhati Medical College in Assam. A study on nontraumatic coma in Karnataka included a total of 50 patients, with 33 of them being male. The current study found no statistically significant disparity in mortality rates between males and females. The findings of this study mirror those of a nontraumatic coma study conducted at Sri Rajarajeshwari Medical College and Hospital in Karnataka, India. In that study, 63.2% of the deaths were men and 36.8% were women, in terms of the causes and outcomes of the coma [11, 12].

Prognosis of the patient can be predicted by assessing vital signs and determining the underlying cause. During this 18-month examination, a total of 60 individuals were assessed. In a study conducted in 2016 at Gandhi Medical College in Secunderabad, it was found that 48.2% of fatalities and illnesses among 100 patients were attributed to intracranial causes. The incidence of deaths within the skull in this study was 42.8%. Recurrent strokes were observed in 66.6% of cases with infarcts and in 81.3% of cases with hemorrhages. Out of the total of seventeen patients with hypertension (HTN), seven of them were also diagnosed with type 2 diabetes mellitus (T2DM), as reported in a study conducted in Karnataka, India. The study focused on investigating the causes and prognosis of nontraumatic coma. Twelve

patients diagnosed with Type 2 Diabetes Mellitus (T2DM) also had Hypertension (HTN). Out of the total of 13 persons who experienced hemorrhagic strokes, 10 of them had hypertension. Hemorrhagic stroke is distinguished by the presence of mass effect, midline alterations, comorbidities, and a lower Glasgow Coma Scale (GCS) score. In a 2016 study conducted at Gandhi Medical College in Secunderabad, it was shown that three out of the 34 patients with cerebrovascular accident (CVA) had rheumatic heart disease (RHD). During the present analysis, there were two patients with cerebrovascular accidents (CVA) who had right ventricular dysfunction (RVD), and one patient without RVD. Neither outcome is statistically significant, however hemorrhagic stroke had a poorer performance than ischemic stroke (p-value 0.317, which is considered inconsequential) [13, 14].

Metabolic issues were implicated in 22 instances, accounting for 31.4% of the total. This made them the second most frequent cause of GCS 10 and responsible for 32.6% of all fatalities. In a study conducted at a specialized medical center, 37 individuals had metabolic encephalopathy, a condition that causes non-traumatic coma. This condition was found to be the cause of 38% of the total deaths observed throughout the study. Out of the eight persons with hyponatremia, five of them showed improvement. Hyponatremia has significant adverse consequences. The value of p is 0.047. A patient with type 2 diabetes who experienced a hyperglycemic coma and subsequent post-ictal seizures made a full recovery. All six instances were associated with Hypoxic-Ischemic Encephalopathy (HIE). There are two available pastures. One individual was on dialysis for chronic kidney illness, another had coronary artery disease, a third had ventricular tachycardia, and the fourth had a condition that occurred after cardiopulmonary resuscitation. Deceased. Results were found to be statistically insignificant, with a p-value of 0.168. Four patients were diagnosed with diabetic ketoacidosis (DKA) and had a dual diagnosis of both type 1 and type 2 diabetes [15].

In contrast to According to a 2016 study carried out at Gandhi Medical College in Secunderabad, which observed patients over a period of time, it was found that one-third of coma patients experienced complete recovery. In 2019, the Goa Medical College and Hospital conducted a prospective observational study at a tertiary care hospital to examine the clinical characteristics, causes, and outcomes of non-traumatic coma. Patients diagnosed with hypertensive encephalopathy and diabetic ketoacidosis (DKA) experienced complete recoveries. Two out of the five patients who experienced hypoglycemic coma and survived were selected for participation in a study conducted in 2016 at Gandhi Medical College in Secunderabad. Two individuals who had sepsis-related hypoglycemia encephalopathy succumbed in the course of this study [15, 16]. A total of nine (11.4%) cases of infection were identified. The result is statistically insignificant with a p-value of 0.689, similar to a study on nontraumatic coma conducted in India's Karnataka state in 2016. There are a total of nine distinct neuroinfections. Septic encephalopathy resulted in the fatalities of seven individuals. A retrovirus infection was identified in one patient. Two individuals had both bacteremia and urosepsis. Two patients who had viral meningoencephalitis together with neuroinfections healed fully. An MRI of one patient revealed hyperintense basal

ganglia and encephalitis. CSF from a different patient was viral. According to Kamat *et al.*, one patient died from viral meningoencephalitis. Two patients with status epilepticus survived. Negative outcomes (P-value 1.000). The prognosis for viral meningoencephalitis-induced status epilepticus (SLE) was better than that for Perry syndrome. A cross-sectional observational study conducted at Gandhi Medical College in Secunderabad on 100 coma patients revealed that individuals with drug poisoning recovered the fastest. Organophosphorous poisoning patient was intubated and survived.

Based on the evaluation of each patient's pupillary reflex, the current study found that 1 out of 21 survivors did not have a good outcome because, at the time of presentation, their pupillary response was absent (p-value 0.05). There were twenty survivors with zits. At Gandhi Medical College in Secunderabad, a cross-sectional study of 100 coma patients revealed that patients with intact brainstem reflexes had a mortality rate of 36.9% and those without significant brainstem reflexes had a mortality rate of considerable ones. At Casualty 47, out of the patients who had aberrant respiratory patterns, eight patients (67.1%) recovered fully and 23 did not [16, 17].

A planned cross-sectional observational study at Gandhi Medical College in Secunderabad with 100 patients found significant mortality with a 0.05 p-value. In 14 cases, a GCS of less than 5 meant that 100% of the victims died. A 2019 prospective observational study at the Goa Medical College and Hospital, Goa, on the clinical features, underlying pathophysiology, and prognosis of non-traumatic coma in a tertiary care setting, revealed increased mortality. A statistically insignificant mortality of 66.7% was seen for GCS 5 to 7 (P-value 0.785). Mortality at 59.4% is statistically insignificant (p-value = 0.116).

The majority of the 60 patients had comorbid conditions, and 100% of patients with chronic renal disease died (p=0.027; statistically significant). Most patients suffered from hypertension. At 67.7%, the death rate was statistically insignificant. p = 0.795 61.5% more patients with type 2 diabetes die. There is a 0.285 p-value. A patient with rheumatic heart disease died, and another suffered a cardioembolic stroke [18, 19].

Conclusion

There is no statistical correlation between age, gender, and the outcome. The majority of the participants were above the age of 40. The most frequent and worst complication of occurrences is intracranial aetiology. People with hyponatremia had significant results. Neuroinfection patients had a favorable prognosis. Hypertension was the most common comorbidity among patients, followed by type 2 diabetes mellitus, which had the greatest mortality rate.

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