

# Clinical Profile, Etiology and Outcome of Non Traumatic Coma in a Tertiary Care Centre

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## ABSTRACT

**Introduction:** Non Traumatic Coma is a very common presentation in emergency department. This study aimed at studying the various etiologies and factors determining outcome in these patients.

**Material and methods:** This prospective observational cohort study was conducted in Goa Medical College and Hospital, over a period of six months on 100 patients of non traumatic coma. Outcome was recorded as either complete recovery, partial recovery with some disability or Death. Various factors affecting outcome were studied.

**Results:** Among 100 cases of non traumatic coma studied, cerebrovascular accidents (33%) and metabolic causes (37%) constitute the major causes. Among cerebrovascular accidents, mortality among those with intracranial bleed was higher (66.6%) than that among cerebral infarct (46%). Metabolic, infective etiologies and drug overdose had better outcome. Patients with low GCS, abnormal respiratory pattern, and papilledema had worse outcome.

**Conclusion:** Mortality was highest among patients with cerebrovascular accident. Patients with metabolic, infective and drug overdose had relatively better outcome. Other factors indicating poor outcome include low GCS, absent oculocephalic reflex, abnormal respiratory pattern and presence of papilledema.

**Keywords:** Non Traumatic Coma, Glasgow Coma Scale, Oculocephalic Reflex

## INTRODUCTION

Coma is defined as a state of prolonged unconsciousness in which a person cannot be awakened by external stimuli and internal need.<sup>1</sup> Non traumatic coma is one of the commonest problem encountered in Emergency Room. A wide variety of etiologies underlie the onset of non traumatic coma. A physician must be well versed with all these etiologies in order to successfully and systematically deal with such patients.

Outcome of patients with non traumatic coma depends upon initial level of consciousness (GCS), duration of altered sensorium, etiology, age, e.t.c.

Hence we conducted this study to determine the etiology, clinical profile and outcome of patients with non traumatic coma in a tertiary care centre.

## MATERIAL AND METHODS

This prospective observational cohort study was conducted in Goa Medical College and Hospital, a Goa's only tertiary care centre and teaching institute over a period of six months. 100 randomly selected patients presenting with

non traumatic coma were included in this study. Prior approval from Institutional Ethical Committee was obtained. Study subjects included were those above 12 years of age presenting to Emergency Department with a GCS of  $\leq 10/15$  for a duration of at least 6 hours. All patients with a history of trauma were excluded from the study. Informed consent was obtained from relatives of patients. A detailed history, physical examination including Glasgow Coma Scale was done for all patients. Necessary investigations like complete haemogram, renal function test, serum electrolytes, liver function tests, blood glucose were done. Special investigations like CSF analysis, CT scan Brain were performed when indicated. Patients were monitored daily and patient's neurological progress was recorded based on GCS. Outcome was recorded as either complete recovery, partial recovery with some disability or Death.

## STATISTICAL ANALYSIS

Data was presented in the form of frequency distribution tables. Statistical analysis was done using chi square test in Microsoft Excel and *p* value was calculated. *P* value of  $< 0.05$  was considered statistically significant.

## RESULTS

A total of 100 patients of non traumatic coma were studied. Mean age of study population was 54 yrs (Range 14- 95 yrs). Majority of cases were in the age group of 41-60 yrs. Outcome of patients in different age groups are given in table 1. Of the total number of cases 68 were males and 32 were females.

There was no statistically significant relation between age group and mortality (*p* value 0.12). However patients more than 40 years were more likely to have poorer outcome. Mortality in those less than 40 yrs was 19% while that in more than 40 yrs was 49.36% (table-1). The reason for higher mortality could be due to additional risk factors like hypertension, diabetes mellitus, ischaemic heart disease in older people.

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Age in years	Total	Complete recovery	Partial recovery	Death
≤20	5	3	1	1
21-40	16	10	3	3
41-60	45	19	3	23
61-80	30	6	9	15
≥81	4	2	1	1

Table-1:

	Etiology	Number of patients
1.	Cerebrovascular accident	
	Infarct	15
	I.C. Bleed	18
2.	Infective	
	Bacterial meningoenzephalitis	1
	Viral meningoenzephalitis	5
	Tuberculous meningoenzephalitis	1
	Septic enzephalitis	8
3.	Metabolic	
	Hyponatremia	3
	Hypernatremia	1
	Hepatic enzephalopathy	20
	Uraemic enzephalopathy	4
	Hypoxic enzephalopathy	3
	CO2 narcosis	2
	Hypoglycemia	2
	Diabetic ketoacidosis	2
4.	Hypertensive enzephalopathy	2
5.	Drug overdose	13

Table-2: Etiology of coma

Etiology	Total patients	Full recovery	Partial recovery	Death(mortality)
Cerebrovascular accidents	33	0	14	19 (57%)
Infective	15	6	2	7 (46%)
Metabolic	37	19	2	16 (43%)
Hypertensive enzephalopathy	2	2	0	0
Drug overdose	13	13	0	0

Table-3: Etiology of coma and outcome

GCS score	Total	Full recovery	Partial recovery	Death(mortality)
≤5	40	8	1	31
6-8	44	23	10	11
9-10	16	9	6	1

Table-4: GCS score and outcome

Oculocephalic reflex	Total cases	Full recovery	Partial recovery	Death(Mortality)
Present	64	39	16	9
Absent	36	1	0	35

Table-5: Oculocephalic reflex reflex and outcome

Respiratory pattern	Total cases	Full recovery	Partial recovery	Death (mortality)
Normal	67	38	14	15
abnormal	33	3	2	28

Table-6: Respiratory pattern and outcome

Papilledema	Total cases	Full recovery	Partial recovery	Death(mortality)
Present	12	2	0	10
Absent	88	38	17	33

Table-7: Fundus and outcome

Among all causes of coma, cerebrovascular accidents (33%) and metabolic causes (37%) constitute the major causes. Among cerebrovascular accidents, mortality among those with intracranial bleed was higher (66.6%) than that among cerebral infarct (46%) (table-2,3).

Among metabolic causes major etiology was hepatic encephalopathy mostly secondary to alcoholic liver disease. Only one of those patient had non alcoholic fatty liver disease due to uncontrolled diabetes mellitus. Mortality among these patients with hepatic encephalopathy was 60%. Patients with Diabetic ketoacidosis, uraemic encephalopathy, hypernatremia and hypertensive encephalopathy had complete recovery. Both the patients were admitted due to CO<sub>2</sub> narcosis expired. Out of 3 patients with hypoxic encephalopathy secondary to near hanging, 1 had complete recovery which 2 patients had residual intellectual impairment due to hypoxic brain damage.

Among infective etiology, viral meningoencephalitis constituted majority of cases (5) with just one death. We observed one case each of bacterial and tuberculous meningoencephalitis. The patient with tuberculous meningoencephalitis was a 25 yr old young boy who had developed hydrocephalus who had to undergo ventriculoperitoneal shunt.

Among patients with drug overdose, most were due to alcohol intoxication and remainder were due to sedative overdose (suicidal). We encountered 2 patients with alleged heroin overdose who were shifted to ICU for ventilator support. One patient each of organophosphorus poisoning and Amitraz poisoning was encountered. All patients with altered sensorium due to drug overdose recovered completely. Patient's with a low GCS  $\leq 5/15$  had a poorer outcome (*p* value  $<0.004$ ) (table-4).

Patient's with absent oculocephalic reflex had poorer outcome (*p* value  $<0.00$ ) (table-5).

Patient's who presented with Cheyne Stokes respiration had bad outcome (*p* value  $<0.00$ ) (table-6).

Presence of papilledema confers bad prognosis and poorer outcome (*p* value  $<0.002$ ) (table-7).

## DISCUSSION

Non traumatic coma remains one of the commonest emergency presenting to casualty. Although multiple international studies have been performed to study the prognosis in these patients, only a few studies have been performed in India.<sup>2,3</sup>

Out of 100 patients of non traumatic coma, 68 were males and 32 were females. Majority of cases were in the age group of 41-60 yrs.

There was no statistically significant relation between age group and mortality (*p* value 0.12). However patients more than 40 years were more likely to have poorer outcome due to associated comorbidities.

### Etiology and outcome

In our study, among all cases, those with cerebrovascular accident and metabolic causes constitute the majority of patients. A study done by Hiremath et. Al.<sup>3</sup> showed similar

result. Among cerebrovascular accidents, intracranial hemorrhage had poorer prognosis than that of cerebral infarct. Patients with cerebral infarct with a GCS less than 5 had bad outcome. Oxburg J.M. et.al.<sup>4</sup> showed that altered sensorium in a patient with ischemic stroke increased mortality to 30%. In our study, patients with metabolic encephalopathy had better outcome except that of hepatic encephalopathy which had a mortality of 60%. Patients with diabetic ketoacidosis, uraemic encephalopathy, hypernatremia and hypertensive encephalopathy had complete recovery. Bustamante J. et.al.<sup>5</sup> showed that survival of cirrhotic patients is poor after the first episode of hepatic encephalopathy i.e. 42% by the end of 1<sup>st</sup> year and 23% by the end of 3 years.

In our study, among infectious etiology those patients with bacterial/viral/tuberculous meningoencephalitis with a lower GCS had poor outcome. This is in accordance with Dodge P.R. et.al.<sup>6</sup> which states that altered sensorium in a patient with bacterial/viral meningitis increases mortality to 50%.

In our study, patients with drug overdose showed better outcome with no mortality. Most patients were admitted due to alcohol intoxication or sedative overdose. One patient had Amitraz overdose. Amitraz is a commonly used insecticide. It is an  $\alpha 2$  adrenergic agonist whose clinical features mimic those of organophosphorus poisoning. Patients typically present with altered sensorium, vomiting, miosis and bradycardia. There is no specific antidote but outcome is usually better with supportive care.

### GCS score and outcome

This study shows that the patients with GCS of  $<5$  had higher mortality (*p* value  $<0.004$ ). This finding is similar to the study conducted by Bansal et.al.<sup>7</sup> and Thacker et.al.<sup>8</sup>

### Oculocephalic reflex and outcome

Patient's with absent oculocephalic reflex had poorer outcome (*p* value  $<0.00$ ). This is in accordance with the study by Levy DE et. Al.<sup>9</sup> and Hamel M.B. et. Al.<sup>10</sup>

### Other factors influencing outcome in non traumatic coma

Patient's who presented with Cheyne Stokes respiration had bad outcome (*p* value  $<0.00$ ). Presence of papilledema confers bad prognosis and poorer outcome (*p* value  $<0.002$ ). These findings are similar to those observed in study by Hamel M.B. et.al.<sup>10</sup>

### Limitation of the study

This study was conducted over a time span of 6 months on 100 patients of non traumatic coma presenting to a tertiary care centre. Small sample size is the limitation of this study.

## CONCLUSION

In this study, we see that the major etiology of non traumatic coma is cerebrovascular accident and metabolic causes. Mortality is highest among patients with cerebrovascular accidents especially intracranial bleed. Metabolic causes have better prognosis except for hepatic encephalopathy and CO<sub>2</sub> narcosis. Infective etiology and drug overdose had relatively better outcome. Glasgow coma scale (GCS) had inverse relation to mortality and is a better prognostic indicator. Patients with GCS  $<5$  had bad outcome. Other factors like

absent oculocephalic reflex, abnormal respiratory rhythm like Cheyne Stokes respiration and presence of papilledema conferred poor outcome in patients with non traumatic coma.

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