

Original Research Article

A study of clinical profile of patients presented with non-traumatic coma

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Abstract

Background: Non-traumatic coma is one of the most common problems in emergency medicine, constituting 10 to 15% of all hospital admissions. Early recognition of the etiology with appropriate history, signs, investigations and timely interventions help us to reduce the mortality and severity of morbidity. This study had been undertaken to know the incidence, etiology, and outcome of non-traumatic coma in 150 patients presented to medical emergency ward of Civil Hospital, Ahmedabad, Gujarat, India.

Materials and methods: This prospective observational study was performed to evaluate the etiology of patients presented with non-traumatic coma in medical emergency ward of civil hospital. Total 150 patients of non-traumatic coma were selected continuously till study end point. Complete history of present illness with preceding symptoms, personal history, family history, and past history of underlying medical or surgical illness have been taken in all patients. All the patients were thoroughly examined to note general examination findings, complete neurological examination and other significant systemic findings. Thereafter all routine investigation was done. Neuro imaging including CT, MRI with contrast and angiography study done as and when required. Final outcome in terms of fully recovered, recovered with persistent neurologic deficit and expired were noted.

Results: In the present study, most common cause of coma was Cerebrovascular Accident (CVA) (38%) followed by infectious causes (28.6%) > metabolic causes (20.6%) > drug poisoning (12%) > undiagnosed case (0.66%). In the present study, the prognosis was best for infectious causes (42.2%) followed by metabolic causes (22.7%). Overall mortality rate was 35.33%.

Conclusion: Non-traumatic coma is a common emergency medical condition in which with proper history, thorough physical examination and selective investigations, it is possible to establish accurate diagnosis in most cases. With ongoing diagnostic evaluation, urgent management is also required for better outcome. Early diagnosis and management is essential for better outcome. In our set up

cerebro-vascular accident, intra-cranial infection and metabolic abnormality are three major causes of non-traumatic coma. Outcome of coma largely depends upon etiology.

Key words

Non-traumatic coma, Cerebrovascular accidents, GCS, Encephalopathy, Infection.

Introduction

Non- traumatic coma is one of the most common problems in emergency medicine, constituting 10 to 15% of all hospital admissions. According to literature, studies in west world indicate, at municipal hospital alcoholism, cerebral trauma and cerebro-vascular events were the most common (82%) causes of coma [1] while studies at university hospital shows somewhat different statistics. Indeed, all intracranial masses and their secondary effects such as tumors, abscesses, hemorrhages, and infarcts-made up less than one-third of the coma-producing diseases. A majority was the result of exogenous (drug overdose) and endogenous (metabolic) intoxications and hypoxia. Subarachnoid hemorrhage, meningitis, and encephalitis accounted for another 5 percent of the total. Thus, intoxication, stroke, and cranial trauma stand as the "big three" of coma producing conditions [2].

This study had been undertaken to know the incidence, etiology, and outcome of non-traumatic coma in 150 patients presented to medical emergency ward of Civil Hospital, Ahmedabad, Gujarat, India.

Materials and methods

The present study was carried out in Tertiary Health Care centre located in Ahmedabad, Gujarat, India. Details of patients admitted in medical emergency ward of civil hospital with diagnosis of non-traumatic coma were collected till study end point.

Inclusion criteria

- Age group >12 years
- Patients presented in medical emergency ward of civil hospital Ahmedabad with non-traumatic coma

Exclusion criteria

- Patients with traumatic coma
- Age group <12 years
- Patients whose relative did not give consent for the study.

Study analysis method

This prospective observational study was performed to evaluate the etiology of patients presented with non-traumatic coma in medical emergency ward of civil hospital. Total 150 patients of non-traumatic coma were selected continuously till study end point. Complete history of present illness with preceding symptoms, personal history, family history, and past history of underlying medical or surgical illness have been taken in all patients. All the patients were thoroughly examined to note general examination findings, complete neurological examination and other significant systemic findings. Fundus examination was done in all patients. Thereafter all routine investigation like RBS, Electrolyte, ABGA, Complete Blood Count, Renal and Liver function tests were done. Toxicology screening, serum cholinesterase, coagulation profile, thyroid profile, CSF investigations, ANA were sent in selected patients according to history and physical examination findings. Neuro imaging including CT, MRI with contrast and angiography study done as and when required. All the patients were given intensive care in emergency ward and treatment given according to standard line of management as per etiology and clinical condition of patients. Final outcome in terms of fully recovered, recovered with persistent neurologic deficit and expired were noted. Written Consent of patient's relative for participation in study was taken in all cases.

Results

Total of 150 patients of non-traumatic coma admitted in tertiary care hospital were studied for various etiological causes, the symptomatology, signs and followed up during their stay in the hospital to evaluate final outcome. Age and Sex Distribution was as per **Table – 1**. Association between age distribution and outcome was as per

Table – 2. Distribution according to mode of onset was as per **Table – 3**. Association between mode of onset and outcome was as per **Table – 4**. Preceding symptoms were as per **Table – 5**. Underlying Medical Illness was as per **Table – 6**. Association between underlying medical illness and outcome was as per **Table – 7**.

Table - 1: Age and Sex Distribution.

Age group (Years)	Female (n=52)	Male (n=98)	Grand Total (n=150)
<20	7	7	14(9.33%)
20-39	27	38	65(43.33%)
40-60	13	31	44(29.33%)
>60	5	22	27(18%)
Grand Total	52(34.6%)	98(65.3%)	150(100%)

Table - 2: Association between age distribution and outcome.

Age Group	Total (n=150)	Death (n=53)	Survival (n=97)
<20	14	1(7.1%)	13(92.9%)
20-39	65	6(9.2%)	59(90.8%)
40-60	44	21(47.7%)	23(52.3%)
>60	27	25(92.6%)	2(7.4%)
Total	150	53	97

P value: 0.57(>0.05) - Not significant

Table - 3: Distribution according to mode of onset.

Mode Of Onset	Total (N=150)
Acute	88(58.6%)
Chronic	48(32%)
Sub-Acute	14(9.3%)
Grand Total	150

Table - 4: Association between mode of onset and outcome.

Mode of onset	Total (N=150)	Death (N=53)	Survival (N=97)
Acute	88	47	41
Chronic	48	5	43
Sub-Acute	14	1	13

P value=< 0.00001= Significant

In the present study many of supratentorial cases has shown cheyne stroke breathing (**Table – 8**). North and Gennett emphasized that cheyne stroke breathing can accompany bilateral damage of the descending pathways anywhere from forebrain to upper pons [3].

In present study, total 20 patients had absent pupillary light reaction while it was present in 126 patients and sluggish in 4 patients. Association between Absence of Pupillary light reaction and poor prognosis was statistically significant (**Table – 9**).

Table - 5: Preceding symptoms.

Preceding Symptoms	Number of cases
Confusion	58
Altered Behaviour	8
Focal Weakness	45
Headache	86
Convulsion	28
Giddiness	41
Fever	65
Vomiting	101
Diplopia	7
Chest Pain, Breathlessness	3

Table - 6: Underlying Medical Illness.

Underlying Medical Illness	No. of cases
Hypertension	35
Diabetes Mellitus	22
Seizure Disorder	3
Chronic Liver Disease	7
Chronic Kidney Disease	3
Thyroid Disorder	7

Table - 7: Association between underlying medical illness and outcome.

Underlying Medical Illness	Total	Death	Survival
Hypertension	35	24	11
Diabetes Mellitus	22	7	15
Chronic Liver Disease	7	4	3
Chronic Kidney Disease	3	1	2
Seizure Disorder	3	0	3
Thyroid Disorder	7	1	6

P Value: 0.07 (>0.05) - Not Significant.

Association between Oculo-cephalic reflex and outcome was as per **Table - 10**. Association between GCS and final outcome was as per **Table - 11**. Comparison of GCS and outcome in other studies [4, 5, 6, 7] was as per **Table - 12**. Comparison of etiologies of other study [12] with the present study was as per **Table - 13**. Comparison of outcome of coma due to various etiologies was as per **Table - 14**.

Association between Midline shift of ≥ 6 mm on CT/MRI in cases of intra-cranial hemorrhage and mortality was statistically significant (**Table - 15**). Similar finding was also noted in study by Fogelholm, et al. [13]. Comparison between present study and other studies [4-12] with regards to etiology of non-traumatic coma was as per **Table - 16**.

Discussion

In present study, out of 150 total patients, 52(34.6%) were females while 98(65.3%) were male. Highest number of patients (65) were from 20-39 years age group followed by 44 patients from 40-60 years age group followed by 27 patients from >60 years age group followed by 14 patients from <20 years age group. Age and sex distribution has no statistically significant association with outcome, though mortality rate is high in older age group. Acute onset in the present study was in 88(58.6%) patients and chronic onset in 48 (32%) and Sub-acute in 14(9.3%). Out of 88 patients with acute onset of coma, 47(53.4%) patients expired. Out of 48 patients with chronic onset of coma, 5(10.4%) patients expired. Out of 14 patients with Sub-acute onset of coma, 1(7.14%) patient expired. Acute onset of coma has statistically significant association with mortality. Vomiting was the most common (101) preceding symptoms followed by headache (86) > fever (65) > confusion (58) > focal weakness (45) > giddiness (41) > convulsion (28) > altered behavior (8) > diplopia (7) > chest pain (3). Most common underlying illness was hypertension in 35 cases followed by diabetes mellitus (22) > chronic liver disease (7) = thyroid disorder (7) > chronic kidney disease (3) = seizure disorder (3). Underlying medical illness has no statistically significant relationship with mortality, though underlying medical illness has relation with etiology of coma. In present study most common pupillary examination was normal size (3-5 mm) in 83 cases followed by bilateral dilatation in 32 cases > pinpoint pupil (12) > unilateral constricted (9) > unilateral dilated (7) = bilateral small (7). In present study total 20 patients had

absent pupillary light reaction while it was present in 126 patients and sluggish in 4 patients. Association between Absence of Pupillary light reaction and poor prognosis is statistically significant. In present study oculo-cephalic reflex

was present in 133 (88.66%) patients while it was absent in 17 (11.33%) patients. Absence of oculo-cephalic reflex and poor prognosis is statistically significant.

Table - 8: Association between respiratory pattern and outcome.

Respiratory Pattern	Total (N=150)	Death (N=53)	Survival (N=97)	P Value
Biot's	1	1	0	<0.05
Cheyne Stokes	23	15	8	<0.05
Deep Rapid	39	7	32	>0.05
Shallow Rapid	10	2	8	>0.05
Shallow Slow	4	1	3	>0.05
Kussmaul's	10	1	9	>0.05
Ataxic	17	4	13	>0.05
Normal	46	22	24	>0.05

Table - 9: Comparison of pupillary reaction and final out-come.

Pupillary Reaction	Death	Fully Recovered	Recovered With Neurologic Deficit	Grand Total
Absent	19	-	1	20
Present	30	81	15	126
Sluggish	4	-	-	4
Grand Total	53	81	16	150

P value: < 0.00001 = Significant.

Table - 10: Association between Oculo-cephalic reflex and outcome.

Oculocephalic reflex	Death	Fully recovered	Recovered with neurologic deficit	Grand Total
absent	12(70%)	5(30%)	0(0%)	17
present	41(30.8%)	76(57.2%)	16(12%)	133
Grand Total	53	81	16	150

P value: 0.00124 = Significant

Table - 11: Association between GCS and final outcome.

GCS	Death	Survival	Grand Total
3-5	47(100%)	0	47
6-8	6(5.82%)	97(94.18%)	103
Grand Total	53	97	150

P value: < .00001 = Significant

In present study, total 47 patients had low GCS (3-5), of them 47(100%) patients expired. Total 103 patients had GCS on higher side (6-8), of which 6(5.82%) patients expired and 97(94.18%) survived. Low GCS is associated with high mortality, which is statistically significant. In the

present study most common cause of coma was CVAs (38%) followed by infectious causes (28.6%) > metabolic causes (20.6%) > drug poisoning (12%) > undiagnosed case (0.66%). Among CVAs supra-tentorial lesions were more common 32% than infra-tentorial lesions which

accounted for 6% of cases. Ischemic strokes were more common 21.33% than hemorrhagic strokes (14%). In the present study the prognosis was best for infectious causes (42.2%) followed by metabolic causes (22.7%). Undiagnosed case showed a bad prognosis with 100% mortality. Mortality rate was highest among CVA patients (75%). Overall mortality rate was 35.33%. Mortality rate was highest in CVA patients (75%). In present study there were total 21 cases of intra-cranial hemorrhage of which 16 (76.2%)

patients expired while 5 (23.8%) patients survived. Out of 16 patients who expired, 13 (81.25%) patients had mid line shift of ≥ 6 mm while only 3 (18.75%) patients had mid line shift of < 6 mm. Out of 5 patients who survived, 4 (80%) patients had mid line shift < 6 mm while only 1 (20%) patient had mid line shift of ≥ 6 mm. Association between Mid line shift of ≥ 6 mm on CT/MRI in cases of intra-cranial hemorrhage and mortality is statistically significant.

Table - 12: Comparison of GCS and outcome in other studies.

Studies	GCS score at admission	Deaths %	Survival%
Sacco, et al. [4]	3-5	85.2	14.8
Thacker, et al. [5]	<4	75.0	25.0
Dhamija, et al. [6]	3-6	84.0	16
Owolabi, et al. [7]	3-5	70.7	29.3
Present Study	3-5	100	0

Table - 13: Comparison of etiologies of other study with the present study.

Etiology	Plum & Posner (n=500) [12]		Present (n=150)	
	No. of cases	%	No. of cases	%
Supratentorial	101	20.20%	48	32%
Cerebral hemorrhage	76	15.20%	18	12%
Infarction	9	1.80%	27	18%
Abscess	6	1.20%	2	1.33%
Tumors	7	1.40%	1	0.66%
Infratentorial	65	13.00%	9	6%
Hemorrhage + Infarction	53	10.60%	8	5.33%
Compressive Lesion	12	2.40%	1	0.66%
Diffuse And Metabolic Brain Dysfunction		65.20%		61.33%
Sub-Arachnoid Hemorrhage	13	2.60%	4	2.66%
Viral Meningo-Encephalitis	14	3.80%	4	2.66%
Tuberculous Meningitis			15	10%
Bacterial Meningitis			5	3.33%
Cerebral Malaria			15	10%
Anoxia	10	2%	3	2%
Hypoglycemia	16	3.20%	8	5.33%
Uremic Encephalopathy	8	1.60%	3	2%
Diabetic Ketosis	12	2.40%	10	6.66%
Hepatic Encephalopathy		29.80%	7	4.66%
Drug Poisoning	149		18	12%
Undiagnosed			1	0.66%
Psychiatric Cause	8	1.60%		

Table - 14: Comparison of outcome of coma due to various etiologies.

Etiology	Death (N=53)	Survival (N=97)	Total (N=150)
1) Intra-Cranial			
A) Vascular/Tumor	40(75.5%)	17(17.5%)	57(38%)
B) Infectious	2(3.77%)	41(42.2%)	43(28.6%)
2) Metabolic	9(17%)	22(22.7%)	31(20.6%)
3) Drug Poisoning	1(1.88%)	17(17.5%)	18(12%)
4) Undiagnosed	1(1.88%)	0(0%)	1(0.66%)

Table - 15: Comparison of neuro-imaging finding (midline shift) and outcome in cases of intra-cranial hemorrhage.

Midline Shift (In Mm)	Death	Survived	Total
< 6 Mm	3	4	7
≥ 6 Mm	13	1	14
Total Cases	16	5	21

P value: 0.0112 (< 0.05) = Significant.

Table - 16: Comparison between present study and other studies with regards to etiology of non-traumatic coma.

Study	Etiology of non-traumatic coma (%)		
	Intracranial	Metabolic	Drug/ Poison
Thacker, et al. [5]	57.5	26.0	5.0
Sharma, et al. [8]	84.0	16.0	0
Dhamija, et al. [6]	68.0	26.7	4.0
Sacco, et al. [4]	35.5	21.9	6.5
Esquevin, et al. [9]	59.0	31.0	0.0
Greer, et al. [10]	49.0	2.0	0.0
Obiako, et al. [11]	46.0	35.0	1.0
Owolabi, et al. [7]	40.0	29.0	0.0
Plum and Posner [12]	45.2	21.4	29.8
Present Study	66.6	20.6	12.0

Conclusion

Non-traumatic coma is a common emergency medical condition in which with proper history, thorough physical examination and selective investigations, it is possible to establish accurate diagnosis in most cases. With ongoing diagnostic evaluation, urgent management is also required for better outcome. Early diagnosis and management is essential for better outcome. In our set up cerebro-vascular accident, intra-cranial infection and metabolic abnormality are three major causes of non-traumatic coma. Outcome of coma largely depends upon etiology. Prognosis of coma can be predicted by integrated

evaluation of clinical findings such as pupillary reflex, brain stem reflex, GCS and selective investigations. With all the efforts and resources available, all causes mortality is very high among these patients and even survived patients had persistent neurologic disability.

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