

Changing Paradigm in Etiology of Non Traumatic Coma Over the Last Fifteen Years

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ABSTRACT

Developing countries like India are facing double burden of diseases i.e. India is still tackling communicable disease whereas non communicable disease are on rise. The present study was conducted in two phases at a tertiary care centre, Bhopal, was conducted to assess the change in etiology of non traumatic coma over 15 years. The first phase of study was conducted from July 2001 to November 2002 on 100 patients whereas the second phase of study was done from June 2018 to October 2019 on 215 patients. A detailed history pertaining to demographic variables and detailed clinical examination along with relevant investigations were conducted and findings were noted in questionnaire. The data thus obtained during both the phases of study was compared and difference in etiology was noted. The present study observed no significant difference in age and gender composition of patients during both the phases ($p>0.05$) however a statistically significant difference in the etiology of NTC was noted i.e. etiology during the phase 1 was infective (33%) whereas during phase 2 etiology were predominantly due to life style related causes such as CVA (54.4%). Our study provides a detailed description of change in etiology of non-traumatic coma over 15 years. We observed that the NTC was predominantly associated with infective causes 15 years back but in present era, non-infective causes such as CVA is the leading cause of NTC. However, infective causes of NTC still persist. So it is strongly recommended that primordial and primary prevention should be the mainstay of intervention to reduce the burden of NCD on health care facility.

KEY WORDS: changing trends, non-traumatic coma (NTC), sepsis, tertiary centre

INTRODUCTION:

Coma is a serious, life-threatening medical condition that require immediate medical care and effective treatment^[1]. Non traumatic coma i.e. coma without a history of a traumatic event signify underlying pathology or may be secondary to various conditions, such as severe sepsis, poisoning and hepatic encephalopathy^[2]. Other causes leading to non traumatic coma include cerebrovascular accidents, drug intoxication, metabolic disturbances, post seizure states/ status epilepticus, meningitis, encephalitis, braintumour, brain abcess etc^[3]. Thus, the treatment of coma depend upon the underlying causes which if not adequately managed may be fatal. To diagnose the etiology of non traumatic coma, it is

important to discriminate between structural and non-structural causes with the help of computer tomography (CT) scan^[4]. Causes of structural coma include cerebral infarction, intracranial hemorrhage, intracranial malignancy and central nervous system infection (e.g. encephalitis or abscess). Non-structural coma include coma as a result of poisoning, epilepsy, extracranial infections, circulatory shock, post-anoxic, cardiac arrest, respiratory failure, metabolic problems (such as hypoglycemia, ionic and acid-base disorders, hypothermia), hepatic encephalopathy and uremic encephalopathy^[2].

The etiologies of coma also depend upon geographical location. Infections were the leading cause of non traumatic coma in developing countries as compared to developed countries^[5]. However Developing countries like India are facing double burden of diseases i.e. India is still tackling communicable disease whereas non communicable disease are on rise. The rise in the incidence of non communicable disease could be attributed to lifestyle changes. Thus the present study was conducted to assess the change in etiology of non traumatic coma with the rise in non communicable diseases.

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MATERIALS AND METHODS:

The present study was designed as a comparative study to assess the change in etiology of NTC over the period of 15 years. The study was conducted in two phases at a tertiary care centre, Bhopal. The first phase of study was conducted from July 2001 to November 2002 on a total of 100 patients whereas the second phase of study was done from June 2018 to October 2019 on 215 patients.

The study included all the patients presenting to Department of Medicine and diagnosed with non traumatic coma belonging to more than 12 years of age. Patients with the history of trauma, fall or RTA or patients diagnosed to have traumatic coma upon investigations and children less than 12 years of age were excluded from the study. A detailed history pertaining to sociodemographic variables such as age, gender, mode of onset of symptoms and progression of disease to arrive at the diagnosis was obtained and entered in the questionnaire. Apart from this, thorough clinical examination of all the patients was done with special emphasis on neurological examination. Relevant investigations were conducted to arrive at a definitive diagnosis. All the patients were followed up daily during the Hospital stay and their outcome was assessed.

The data thus obtained during two phases of study was thus compared to assess the etiology of NTC during both the phases. Data was compiled using Ms Excel and analysed using SPSS software version 20. Chi square test was applied to assess the difference between two phases, $p\text{-value} < 0.05$ was considered significant whereas $p\text{-value} < 0.01$ was considered highly significant.

RESULTS:

The study included 100 patients during first phase and 215 patients during the second phase.

The present study observed no significant difference in age and gender composition of patients during both the phases ($p > 0.05$). Thus the study population of both the phases was comparable. Majority of patients belonged to 61 to 80 years of age i.e. 34% during phase 1 and 34.9% during phase 2. About 56% and 65.6% patients with NTC were males during phase 1 and phase 2 of study respectively.

The infective etiology was observed in 33% patients during phase 1 whereas it was observed in only 10.7% patients during phase 2 of the study. Non infective causes attributed to 67% and 89.3% cases of NTC during phase 1 and phase 2 respectively. The present study observed a statistically significant shift

in etiology of NTC from infective causes during phase 1 (33%) to non infective and life style related causes during the period of phase 2 ($p < 0.01$).

The present study documented significantly better outcome in terms of discharge of patients during second phase of study ($p < 0.01$).

DISCUSSION:

This study depicts the changing trends in the etiology of non traumatic coma over the period of fifteen years. Various studies have assessed the etiologies and prognosis of non traumatic coma but none have shown the trends. The inclusion and exclusion criterion throughout the study period was same. Maximum patients in both the phases belonged to 61 to 80 years of age and maximum patients diagnosed with NTC were males. The demographic variables of patients of both the phases were comparable ($p > 0.05$). Hiremath RS et al conducted a study in 2016 also documented the most common age group of patients presenting with non traumatic coma as 51 to 60 years (26%) followed by 61 to 70 years (20%).^[6] However Sarin SM et al in their study in 2016 observed lower mean age i.e. 47.61 years as compared to our study^[7]. Male predominance in the occurrence of non traumatic coma was supported by Wong CP et al in which the authors observed non traumatic coma in 155 male and 123 female^[8]. Thus non traumatic coma occur in patients with advancing age and in male patients.

Our study aimed to study the shift in etiology of non traumatic coma from infective pathology to non infective pathology as evidenced by increase in incidence of non communicable diseases. Amongst infective causes, cerebral malaria were observed in 14% cases during first phase of study whereas that after 15 years were observed in none. However, pyogenic meningitis and TBM were the cause in 19% and 4.6% patients in phase 1 and phase 2 respectively. Non infective causes were responsible for 89.3% cases during phase 2 as compared to 67% in phase 1 and the observed difference in etiologies between both the phases was statistically highly significant ($p < 0.01$). In 2001 Wong CP et al conducted the study and observed infection as the commonest cause of non-traumatic coma, accounting for 38% of cases followed by intoxication, epilepsy, and complications of congenital abnormalities^[8]. However Sarin SM et al in their study on 80 patients in 2016 documented most common cause of non traumatic coma was Cerebrovascular accident (45%) followed by metabolic encephalopathy, CNS and other infections, septicemia and poisoning^[7]. The findings of our study

Table 1: Distribution according to sociodemographic variables.

Sociodemographic variables		Phase 1 (n=100)		Phase 2 (n=215)		χ^2	p-value
		Frequency	Percentage	Frequency	Percentage		
Age group (years)	≤20	7	7	13	6	2.62	0.63 (NS)
	21-40	24	24	43	20		
	41-60	33	33	72	33.5		
	61-80	34	34	75	34.9		
	>80	2	2	12	5.6		
Gender	Male	56	56	141	65.6	2.67	0.10 (NS)
	Female	44	44	74	34.4		

Table 2: Distribution according to etiology.

Etiology		Phase 1 (n=100)		Phase 2 (n=215)	
		Frequency	Percentage	Frequency	Percentage
Infective	Pyogenic meningitis	15	15	5	2.3
	TBM	4	4	5	2.3
	Cerebral malaria	14	14	0	0
	Hepatitis	0	0	1	0.5
	Sepsis	0	0	12	5.6
	Uremia	4	4	0	0
	DKA	3	3	9	4.2
Non-infective	Hepatic	12	12	33	15.3
	Poison	5	5	21	9.8
	Hypoxia	2	2	0	0
	CKD	0	0	10	4.7
	CVA	41	41	117	54.4
	GBS	0	0	1	0.5

 $\chi^2=8.28$; p=0.004**Table 3:** Distribution according to outcome of patients.

Outcome	Phase 1 (n=100)		Phase 2 (n=215)	
	Frequency	Percentage	Frequency	Percentage
Death	55	55	62	28.9
Discharge	45	45	153	71.2

 $\chi^2=20.01$; p=0.001

were also supported by systematic review of Horsting WB et al (2015). The authors in the reference study observed infections as the common cause in developing country but overall the most common causes for NTC were stroke, post-anoxic coma, poisoning and metabolic^[9].

Our study also documented significant improvement in outcome of patients of phase 2 as compared to outcome of patients 15 years back. This could be explained by technological advancement and overall improvement in medical care of the patients.

CONCLUSION:

Our study provides a detailed description of change in etiology of non traumatic coma over the 15 years. We observed that the NTC was predominantly associated with infective causes 15 years back but in present era, non infective causes such as CVA is the leading cause of NTC. However, infective causes of NTC still persist. The understanding of shift of etiology from infective to non infective cause is essential to provide early diagnosis and appropriate

treatment of non traumatic coma. So it is strongly recommended that primordial and primary prevention should be the mainstay of intervention to reduce the burden of NCD on health care facility in the country.

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