

Incidence, Aetiology, Outcome of Non-Traumatic Coma: A Study at Tertiary Care Hospital

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Abstract

Objectives: To study the incidence, aetiology, and outcome of non-traumatic coma in children. **Materials and Methods:** 100 consecutive cases of non-traumatic coma between 6 months and 15 years of age were selected for the study. Aetiology of coma is determined on the basis of clinical history, examination, and relevant laboratory investigations by the treating physician. These children were followed up till they discharged from the hospital. **Results:** A total of 100 cases of children admitted to the hospital with Non-traumatic coma was included in the study. Majority of the children were in the age group of 1-5yrs (41%), males were slightly more affected than females. Mortality was high in the age group of 1-5 yrs. CNS infections accounted for 70% of cases. Toxic/Metabolic group constituted 19% of cases, followed by other causes. Mortality was high in children with intracranial space occupying lesions and intracranial bleeds. CNS infections had slightly better survivals as compared to toxic/metabolic and IC bleeds. **Conclusion:** Acute non-traumatic coma is one of the most common pediatric emergencies, which arouses much anxiety and apprehension in both parents and physicians. Due to heterogeneity of causes in these patients, prediction of outcome is difficult and unfortunately no single clinical, laboratory or electrophysiological parameters singly predicts their outcome. We have attempted to delineate neurological signs to predict the prognosis in this study.

Keywords: CNS infections; Non-traumatic coma; Intracranial bleeds; Mortality.

Introduction

There is an increasing awareness that non-traumatic coma is an important source of morbidity and mortality in the pediatric age group.[1]

Acute non-traumatic coma is a common problem in pediatric population accounting for 10-15% of all hospital admissions[2] these children make heavy demands on pediatric intensive care unit and rehabilitation resources. Additionally, coma is recognised to be a non-

specific sign with a wide potential differential diagnosis, design of appropriate and efficient protocols of investigations for coma require an understanding of the relative frequencies of the various potential aetiologies.[3]

Materials and Methods

This is a prospective observation study conducted in the age group of 6 months to 15 years admitted to our tertiary care hospital attached to J.J.M. Medical college from July 2011 to July 2012 written consent was taken from the patients attenders and permission was taken from the ethical committee.

All children between 6 months and 15 years of age admitted with coma of less than 7 days duration were included in the study.

Coma was defined as sleep like responsiveness without evidence of awareness of the self or environment, a state from which patient could not be aroused. The operational

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Grades of Severity of Neurological Outcomes

Category	Neurological Status
I. (Intact)	Normal or no change from premorbid functioning, seizures, if recorded, 100% controlled.
II. (Mild)	Minimal alteration of tone, power or reflexes & isolated cranial nerve palsies, mild weakness or ataxia, seizures if present >75% controlled.
III. (Moderate)	Moderate weakness or ataxia multiple cranial nerve involvements seizures if present >50% controlled
IV. (Severe)	Severe weakness or ataxia, tetraparesis, uncontrolled seizures.
V. (Profound)	Persistent vegetative state
VI. (Death)	

criteria were that such patients failed to open their eyes either spontaneously or in response to noise, they expressed no comprehensible words and they neither obeyed commands nor moved their extremities approximately to localize or resist painful stimuli.[4] Children with neurodevelopmental delay, any other pre-existing neurological illness and those in whom the coma was secondary to trauma were excluded from the study.

After initial stabilisation of the patient all of them were evaluated at admission by detailed history taking, clinical examination, MGCS grading. All the patients underwent a serial neurological examination as per the standard protocol that is MGCS SCORING and

brainstem reflexes at 6th hourly intervals, from the time of admission to 72hrs after the admission and the findings were recorded in the proforma, relevant and proper investigations were done accordingly.

All the patients who survived were followed till discharge from hospital.

The outcome of non-traumatic coma was allocated into 6 categories based on the severity of neurological impairment.

All the data from the standardized study forms were entered in the computer data box for analysis using SPSS Software.

Results

Table 1: Age Wise Distribution of Cases

Age (in yrs)	Total (no.)
<1yr	13
1-5yrs	41
6-10yrs	28
11-15yrs	18

Table 2: Sex Wise Distribution of Cases

Sex	Total
Male	55
Female	45

Table 3: Sex Wise Distribution of Cases & Outcome

Sex	Total	Survived	Died
Male	55	43	12
Female	45	35	10

A total of 100 cases of acute non-traumatic coma were included in the study, Age group ranged from 6 months to 15 years, majority of children were in the age group of 1-5 years (41%) [Table 1] and males constituted around 55% [Table 2]. Difference between the mortality rates were slightly higher in males [Table 3]. Mortality rate was high in age group of 1-5 yrs.[Table 4].

Table 4: Age Wise Distribution of Cases and Outcome

Age	Total	Survived	Death
<1 Yr	13	10	3
1-5 Yrs	41	31	10
6-10 Yrs	28	23	5
11-15 Yrs	18	14	4

Table 5: Etiology of Coma and Outcome

CNS Infections	Total	Survived	Death
Dengue Encephalitis	25	20(80%)	5(20%)
Viral Encephalitis	23	19(82.6%)	4(17.4%)
Pyogenic Meningitis	9	7(77.7%)	2(22.3%)
Tubercular Meningitis	9	7(77.7%)	2(22.3%)
Cerebral Malaria	2	1(50%)	1(50%)
Shigella Encephalopathy	2	2(100%)	0(0%)
Toxic / Metabolic			
Hepatic Encephalopathy	5	4(80%)	1(20%)
Hypoxic Encephalopathy	2	2(100%)	0(0%)
Diabetic Ketoacidosis	5	4(80%)	1(20%)
Organo Phosphorous Poisoning	3	2(66.6%)	1(33.3%)
Snake Bite	2	1(50%)	1(50%)
Inborn Errors Of Metabolism	2	2(100%)	0(0%)
Intracranial Bleed	2	1(50%)	1(50%)
Others			
Hypertensive Encephalopathy	2	2(100%)	0(0%)
Intra Cranial Space Occupying Lesions	3	1(33.3%)	2(66.7%)
Cerebral Palsy	2	2(100%)	0(0%)
Post-Status Epilepsy	2	1(50%)	1(50%)

Table 6: Etiology and Outcome on Basis of Disability

Etiology	I	II	III	IV	V	VI	Total
Cns Infections	30	16	5	4	1	14 (20 %)	70
Toxic / Metabolic	10	3	2	1	1	2 (10.5 %)	19
Status Epilepsy	1	0	0	0	0	1(50 %)	2
Intra Cranial Bleeds	0	0	0	0	1	1(50 %)	2
Others	2	2	1	0	0	2(28.5 %)	7

CNS infections accounted for 70% of cases. Toxic/Metabolic group constituted 19% of cases, followed by other causes[Table 5]. Mortality was high in children with intracranial space occupying lesion, and intracranial bleeds.

CNS infections had slightly better survivals as compared to toxic/metabolic and IC bleeds.

Discussion

Out of 500 cases of non-traumatic coma admitted, 100 consecutive cases were selected for the study after considering inclusion and exclusion criteria of them 55 were males and 45 were females the male to female ratio being 1.2:1.

This study showed that difference in the

mortality rates among males and females were not statistically significant these finding are consistent with other Indian studies.[5]

It was observed that neuroinfections were the commonest causes of non-traumatic coma in children, these findings are consistent with other studies.[5,6] However the type of infection seems to vary in different parts of the world,for example cerebral malaria was common in Africa,[7] whereas Dengue Hemorrhagic Fever was an important cause of coma in South East Asia. In our study we found that Dengue fever with encephalitis was the commonest aetiology (25%). The importance of infective aetiologies in children is in sharp contrast to adult hospital based series where degenerative and cerebrovascular pathologies predominate.[8] The overall mortality 22% slightly higher compared to

other hospital based study, but on par with other south-east Asian studies.

The basic management include rapid assessment and stabilization, focused clinical evaluation to assess the depth of coma, localization of the lesion in central nervous system and possible clues for the aetiology and treatment including general and specific measures. Commonly associated problems like raised intra cranial pressure and seizures should be controlled to prevent secondary neurological injury.[9]

Conclusion

CNS Infection constituted the major bulk of childhood non- traumatic coma, Dengue & Viral encephalitis were in the majority group, the overall outcome of CNS infections was significantly better than toxic/metabolic group, & among survivals most of them improved with intact neurological outcome.

References

1. Seshia SS, Seshia MM, Sachdeva RK. Coma in childhood. *Dev Med Child Neurol*. 1977; 19: 614-28.
2. Tasker RL, Cole GF. Acute encephalopathy of childhood and intensive care. In Brett EM [Editor]. *Pediatric Neurology*. 3rdedn. Edinburgh: Churchill Livingstone; 1996, 691-729.
3. Wong CP, Forsyth RJ, Kelly TP, Eyre JA. Incidence, aetiology and outcome of non-traumatic coma: population based study. [coma in children from age 1 month to 16 years] *Archives of disease in childhood. Fetal and neonatal edition*. March, 2001
4. Levy DE, Bates D, Caronna JJ. Prognosis in non-traumatic Coma. *Ann Intern Med*. 1981; 94: 293-301.
5. Bansala A, Singhi SC, Singhi PD, Khandelwal N, Ramesh S. Non-traumatic coma. *Indian J Pediatric*. 2005; 72: 467-68.
6. Vijaykumar K, Knight R, Prabhakar P, Murphy PJ, Sharples PM. Neurological outcome in children with non-traumatic coma admitted to a regional pediatric intensive care unit. *Arch Dis Child*. 2003; 88: A30-32.
7. Sofiah A, Hussain HM. Childhood non-traumatic coma in kuala Lumpur, Malaysia. *Ann Trop Pediatr*. 1993; 17: 327-31.
8. Bates D, Caronna JJ, Cartledge N, *et al*. A Prospective Study Of non-traumatic Coma: Methods and Results in 310 patients. *Ann Neurol*. 1977; 2: 211-220.
9. Sharma S, Kochar GS, Sankhyan N, Gulati S. *Indian J Pediatr*. 2010; 77: 1279-87.