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CLINICAL SPECTRUM OF CHILDREN PRESENTING WITH ALTERED SENSORIUM TO PEDIATRIC EMERGENCY DEPARTMENT.

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ABSTRACT

AIMS AND OBJECTIVES: To determine the prevalence and to assess the cause of altered sensorium in critically ill children.

MATERIALS AND METHODS: A prospective descriptional study was done on 36 children who came to Pediatric emergency department of GSL hospital with history of altered sensorium, between July 2017 to August 2018. The sample was classified into two groups, one with primary (CNS) cause and the other with systemic and miscellaneous causes, attributed to cause of altered sensorium. Children were examined clinically and investigated as required, metabolic screening like serum electrolytes, serum calcium, serum glucose, lumbar puncture CSF analysis, CT scan and MRI as and when required.

RESULTS: Pre-school children were affected with slight majority, while the least affected belonged to adolescent age group. A large proportion of children who were admitted with the diagnosis of intracranial infections, which was followed by systemic disease – causing altered sensorium.

CONCLUSION: Though, altered sensorium is mainly caused by intracranial infections, it is not to be forgotten as a complication of systemic disease. This study confirms intracranial infections are primarily pyogenic followed by viral etiology. Systemic diseases causing altered sensorium include DKA, severe anemia with cardiac failure and acute renal failure.

KEYWORDS : altered sensorium, intracranial infections, pyogenic meningitis

INTRODUCTION:

Altered sensorium in children is a medical emergency(2). It could be a manifestation of disease of CNS and also a complication involving systemic disease. The clinical features and etiological spectrum are variable depending on the studied population.

Altered sensorium is an important cause of morbidity and mortality in childhood. It accounts for 10-15% of all hospital admissions(4). Altered sensorium is generally a complex state, reversing as the underlying condition abates or when triggers are removed. Clinically, causes of altered sensorium is categorized into:with focal signs (Intracranial haemorrhage, Stroke), without focal signs and without meningeal irritation (hypoxia-ischemia, metabolic), without focal signs and with meningeal irritation (meningitis, encephalitis) (1). The potential causes of altered sensorium are numerous, and the critical window for diagnosis and effective intervention (not only to ensure survival but also to prevent long-term sequelae) is short (2). Considerable skill is required to identify children at risk for further deterioration and possible disability or mortality(11).

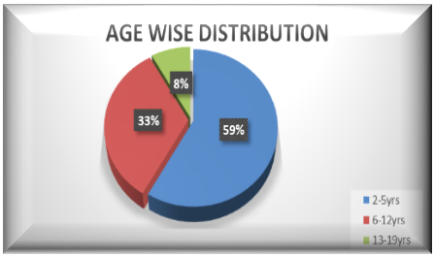
A better understanding of most common etiology and outcome could help us improve the management of children with altered sensorium(3). This study helps us in understanding the common cause of altered sensorium presenting in children.

MATERIALS AND METHODS:

A prospective descriptional study was done on children who arrived to Pediatric emergency department to GSL hospital with history of altered sensorium, between July 2017 to August 2018. Children with intellectual disability, motor disability, hearing and speech impairment, chromosomal anomalies, in post ictal phase and history of trauma were excluded from the study. Data collected include age, sex, and presenting symptoms. Diagnosis, clinical features and outcome were studied. The sample was classified into two groups, depending on the causes of altered sensorium, one with primary (CNS) cause and the other with systemic and miscellaneous causes. Children were examined clinically and investigated as required. Clinical features noted at the time of admission were heart rate, respiratory rate, blood pressure, tone, pupillary reflex and fundus. Screening tests included serum electrolytes, serum calcium, serum glucose, lumbar puncture and CSF analysis, CT scan and MRI as and when required. The obtained data was analyzed by using SPSS (statistical package for social sciences) trial version 21. The level of p <0.05 was considered significant.

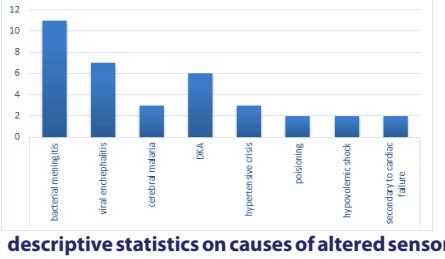
RESULTS:

A total of 36 children had been admitted with history of altered sensorium. Out of these 36 cases, 59% belonged to the age group 2-5years; 33% belonged to 6-12years and 8% belong to 13-19 years. There was a variation in age dependent incidence with an increased incidence in 2-5 year age group (p=0.041). Proportion of male and females were 40% and 59.6% respectively. The data was analyzed.



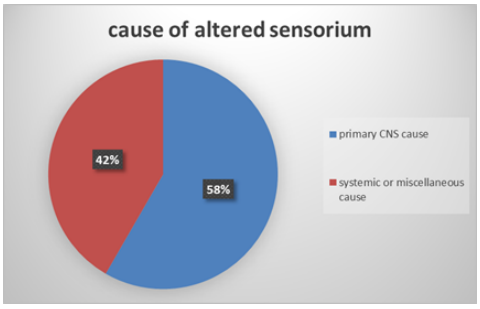
Graph 1: Age-wise distribution of data

The sample's presenting symptoms were convulsions (13 cases), fever (20 cases), headache (7cases), vomiting (4cases), features of shock (4cases), neurological deficit (4 cases) visual symptom-blindness (1 case). Most of the children presented with more than one symptom. Convulsions and fever were the most common symptoms.



Graph 2: descriptive statistics on causes of altered sensorium

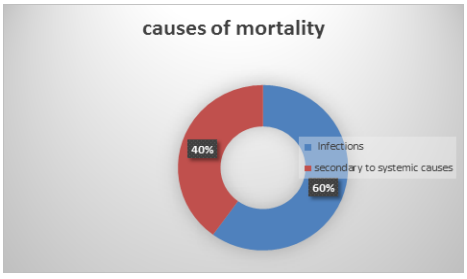
Infections were the predominant cause of altered sensorium, accounting for 21 cases. Acute bacterial meningitis is the most common disease followed by viral meningitis. Other causes were diabetic ketoacidosis (18.75%), hypertensive crisis (8.33) %, poisoning (5.55%), hypovolemic shock (5.55%) and secondary to cardiac failure (5.55%).



Graph 2: cause of altered sensorium with etiology attributing to primary CNS cause or systemic/miscellaneous cause

Etiology of primary CNS cause leading to altered sensorium was found to be more significant (58% (p=0.009)) than with systematic or miscellaneous cause.

Among the 36 children presenting with altered sensorium, there were 5 deaths (13.8%). 3 deaths were noted out of 7 children who were admitted for viral encephalitis. These children had significant cerebral edema and intracranial hypertension. 1child (20%) was admitted for altered sensorium caused due to organophosphorus poisoning died, the cause of death was severe respiratory failure. Another child died, who was diagnosed with severe anaemia with cardiac failure and sepsis. This child experienced intractable seizures and pulmonary edema. 2 children showed moderate disability caused by bacterial meningitis.



Graph 3: Causes of mortality in sample

DISCUSSION:

Altered sensorium in pediatric age group demands significant intensive care resources. It can result from wide variety of primary and secondary etiologies, posing a diagnostic challenge for pediatricians(4). The study of these etiology can help us understand and treat children with altered sensorium(3). In addition to on-time diagnosis, proper treatment for full recovery and to prevent grievous complications, it is important to obtain information on the prevalence of the causes of altered sensorium in children. Most of the studies that are done with respect to altered sensorium were done in developed countries(3). There is limited literature on the infective etiology of altered sensorium. This prospective study, brings out the etiology and demographic variables of altered sensorium, in a tertiary care hospital in Rajahmundry(2).

In the present study out of 36 cases maximum cases were in the age group of 2-5 years (59%). No significant relationship was seen between causes of altered sensorium and sex. A study done by sugathi et al (5) has shown predominance of altered sensorium in age 3-6 years. Most common cause for altered sensorium was found to be CNS infection. In the study done by sashi s et al(6), it was found CNS infections contributed to 58% of cases of altered sensorium as compared to 68% shown in the present study. The reason for huge variation in the causes may be condemned to sample size; in the present study the sample size taken was 36, while in the study done by sashi S (5) , et al was 342.

There was no significant difference in the mortality between age groups. Flaccidity, hypothermia, non-reactive pupillary reflex and papilledema may contribute to risk factors for mortality in children with altered sensorium(9).

The limitation of this study are limited sample size, due to which the results can't be genralised to larger population. As no cases with metabolic defects were presented to pediatric emergency department, metabolic cause for altered sensorium as an etiology could not be evaluated in the present study. Since the sample has been collected from only GSL pediatric emergency ward, the sample cannot be generalized to other districts of Andra Pradesh or states of India.

The further implications of present study: the same study needs to be conducted across Andhra Pradesh and other states of India, with larger sample size, for being able to generalize the findings to the entire population. A study on metabolic cause for altered sensorium as an etiology should be conducted.

CONCLUSION:

Though, altered sensorium is mainly caused by intracranial infections, it is not to be forgotten as a complication of systemic disease(3). This study confirms intracranial infections are primarily pyogenic followed by viral etiology. Systemic diseases causing altered sensorium include DKA, hypertensive crises and severe anemia with cardiac failure(1).

Many infective causes of altered sensorium are preventable with vaccines, controlling malnutrition and anemia(7). Other essential public health measures include safe water supply, sewage disposal, mosquito control, and timely access to child health care, for both preventive and illness related. Education on physical hygiene, may minimize poisoning and DKA(8). Other steps include being aware of and identifying populations at risk for mortality in children with altered sensorium.

CONFLICT OF INTEREST:

This study has no conflict of interest to declare by any author.

SOURCE OF FUNDING: None

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