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A study of clinical profile and laboratory-radiological findings in acute encephalitis syndrome in children at a tertiary care hospital.

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Abstract

Acute Encephalitis Syndrome (AES) is a major cause of morbidity a[illegible]lity in children. Although viruses have traditionally been identified as the main causative [illegible]ts of [illegible] in India, more recently, reports of bacteria and toxins have also been made. The purpo[illegible]f this [illegible]dy was to identify the clinical characteristics, radiographic, and laboratory par[illegible]ters, a[illegible]utcome of AES in children. Over the course of six months, this prospective observ[illegible]tion[illegible]dy w[illegible] carried out in the pediatric department of SMIMER medical college an[illegible]ospital [illegible]urat. [illegible]diagnosed cases of AES in children ranging in age from one month to eighteen years were [illegible]ded [illegible] the study. Every patient's clinical characteristics, lab results, radiological result[illegible] outc[illegible] (discharge, DAMA, or death) were documented.

The study found that fever (85.7%) and s[illegible]e (71.4[illegible]ere the most common clinical presentations followed by vomiting (64.3%), altered sens[illegible]n (50%), headache and diarrhea being 14.3% each. MRI findings were abnormal in 75% of the pati[illegible]arenchymal hyperintensity (66.66%) and diffuse cerebral edema (33.33%) being [illegible]e most common findings. The laboratory parameters include neutrophila (78.6%) as the most [illegible]mon fin[illegible]ings along with anaemia (64.3%), leucocytosis (50%) and thrombocytopenia (35.7[illegible] Incr[illegible]F protein (>60 mg/100 ml) was found in 54.5% and CSF pleocytosis (>5 cells) in [illegible]6.4[illegible]he research emphasizes how crucial it is to manage AES patients using evidence-based p[illegible]actic[illegible]s. [illegible]roved diagnosis and management of AES may result from a greater grasp of th[illegible]otent[illegible] and [illegible]onstraints associated with the administration and application of common laborator[illegible] and dia[illegible] techniques.

Keywords: Acut[illegible]ephali[illegible]ndrome, Neurology, CSF, Seizure.

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Introdu[illegible]ion

[illegible]te Enc[illegible]litis S[illegible]drome (AES), which primarily affects c[illegible]en in d[illegible]g nations, is a significant public health co[illegible]rn in many of these nations. AES can cause severe n[illegible]onsequences and a high death rate. It is typified [illegible]y an abrupt onset of fever and encephalitis, either with or [illegible]hout seizures. Season and geographic region play a role in [illegible]ology of AES; in India, viruses are most frequently id[illegible]ntified as the cause. Toxins and other microorganisms, however, have also been implicated in AES cases [1,2].

Assessing AES cases as soon as possible is essential to lowering mortality and morbidity. Admitted to critical care units frequently, children with AES require specific care that includes nourishment, hydration, seizure control, and vital sign monitoring. Nonetheless, AES has no particular treatment; instead, supportive care is the mainstay of care [3-9].

The purpose of this study is to look at the symptoms, laboratory parameters, radiological findings and consequences of AES in pediatric patients in a hospital environment. The results of this study can aid in the creation of efficient management and treatment plans that will lessen the burden of AES disease. The study, which comprised 14 identified cases of AES, was carried out over the course of 6 months at the pediatric department of SMIMER medical college and hospital in Surat. These individuals' clinical characteristics, research findings and prognosis were documented, and the study's findings should offer crucial new understandings into the treatment of AES in young patients.

Case Presentation

Study sites

SMIMER medical college and hospital, is a tertiary care hospital in Surat, Gujarat.

Study design

This was a hospital-based observational study.

Timeline of the study

The study was conducted from September 1st, 2023 to February 29th, 2024.

Sample size

All children admitted to the pediatric department of SMIMER medical college and hospital during the study period and diagnosed with AES, who fulfilled the inclusion and exclusion criteria, were included in the study.

Inclusion criteria

The following criteria were used to include patients in the study:

- Children diagnosed with AES according to the WHO case definition.
- Children aged between 1 month and 18 years whose parents provided written informed consent.

Exclusion criteria

The following criteria were used to exclude patients from the study:

- Children with a history of simple febrile seizure.
- Patients with pre-existing neurological deficits prior to the onset of AES.
- Neonates (aged from birth to 28 days).

Method of study

This study was conducted in the pediatric department of SMIMER medical college and hospital, Surat, Gujarat over a period of 6 months. Every patient was systematically examined with the help of a structured proforma that was pre-designed, and their parents/legal guardians provided written informed consent. Clinical features and symptoms of the patient at the time of presentation to the hospital were recorded in form of fever, seizure, altered sensorium, vomiting or diarrhea, headache, GCS of the patient at time of presentation and if any meningeal signs or cranial nerve involvement is there or not.

After admission to hospital, relevant laboratory investigations were sent after stabilization of the patient and also MRI was done. In never patient it was possible. Under all the aseptic precautions, 5 ml of blood and 2 ml of CSF were collected and immediately sent to the central laboratory of SMIMER hospital for evaluation. The parameters studied were anemia, leukocytosis, neutrophilia, thrombocytopenia, CSF pleocytosis (>5 cells) and CSF protein (>60 mg/dl).

Results

Demographic profile

In total, the hospital admitted 14 patients with Acute Encephalitis Syndrome (AES). There were 9 (64%) males and 5 (36%) females among them 4 (28.5%) of the cases involved children between the ages of one month and one year, 3 (21.5%) involved children between the ages of one year to less than five years, and 7 (50%), children between ages five and eighteen years.

Clinical profile

Fever was present in 12 cases (85.7%) and Seizures were reported in 10 cases (71.4%), being the most common symptoms. Vomiting was seen in 9 (64.3%), altered sensorium in 7 (50%), headache in 4, diarrhea was seen in 2 (14.3%) cases. Complications in the form of low GCS (<8) was seen in 7 (50%) cases and meningeal signs were observed in 3 (21.4%) cases. None of the patient had any cranial nerve involvement.

Laboratory and radiological findings

Anemia was seen in 6 (42.3%) and leukocytosis in 7 (50%) cases, and it was found that neutrophilia was observed in 11(78.6%) cases. Thrombocytopenia was observed in 5 (35.7%) cases. CSF study showed the increased count or pleocytosis (>5) in 4 (28.4%) and increased CSF protein (>60 mg/dl) was seen in 6 (42.5%) patients.

MRI was normal in 2 (25%) patients and abnormal in 6 (75%). Among the abnormal findings diffuse cerebral edema was observed in 2 (33.33%), parenchymal hyperintensity in 4 (66.66%), diffuse meningeal enhancement in 1 (16.66%) and cerebral atrophy in 1 (16.66%) patients.

Outcome of AES patients

Among the 14 cases of AES patients, 5 (35.7%) patients took DAMA and 1(7.1%) was discharged home, while 8 (57.2%) patients expired during hospitalization (Tables 1-6).

Age	AES	%
1-1 year	4	28.5
1-5 year	3	21.5
5-18 year	7	50

Table 1. Shows the age distribution of AES patients (n=14).

Sex	AES	%
Male	9	64.28
Female	5	35.72

Table 2. Shows the sex distribution of AES patients (n=14).

Clinical profile	AES	%
Fever	12	85.7
Altered sensorium	7	50
Seizure	10	71.4
Headache	2	14.3
Vomiting	9	64.3
Diarrhoea	2	14.3

GCS<8	7	50
Meningeal signs	3	21.4
Cranial nerve involvement	0	0

Table 3. Shows the clinical profile of children with AES.

Laboratory features	AES	%
Anaemia	9	64.3
Leucocytosis	7	50
Neutrophilia	11	78.6
Thrombocytopenia	5	35.7
CSF pleocytosis >5	4	36.4
CSF protein >60	6	54.5

Table 4. Shows laboratory findings of children with AES.

MRI findings	AES	%
Normal	2	25
Abnormal	6	75
Diffuse cerebral edema	2	33.33
Parenchymal hyperintensity	4	66.66
Diffuse meningeal enhancement	1	16.66
Cerebral atrophy	1	16.6

Table 5. Shows MRI findings in AES patients.

Outcome	AES	
DAMA	5	35.
Discharge	1	
Expired	8	57.2

Table 6. Shows t ome of c dren with AES.

Discussion

mogra details of AES patients

T majority of AES cases in the current investigation, with a n of 02 years, were found in the age range of 5 to 18 years. These results are in line with previous research by kakoti et al., [1], Sarkar et al., [5] and Khound M et al., [6], similarly discovered that the age range most frequently impacted by AES was 5-18 years old. This finding underscores the necessity of focused preventive actions and draws attention to how susceptible young children and adolescents are to AES.

In terms of gender distribution, our research revealed that males had a higher frequency of AES cases (64.28%) compared to females (35.72%). This finding is in line with previous research conducted by Khound et al., [6], Sarkar et al., and Kakoti et al., [1]. More research is necessary because it is unclear why there is a gender difference in AES.

Clinical profile and complications of AES patients

According to the current study, fever (85.7%) eizures (71.4%) were the most frequent clinical symptoms AES, followed by altered sensorium (50%), g (6 headache (14.3%), and diarrhea 14.3%). These lts are in line with previous research b su et a 8] and inchi et al., [7], which similarly found that ver a red ensorium were the most typical signs of AES in child These non-specific clinical ch ve many different etiologies. Therefore, p er care and p osis depend on a thorough diagnosis of the underlying cause of AES. The complications which were fou d in our study, low GCS (<8) was found in 50% of AES pati s and meningeal signs in 21.4% cases. These findings were consistent the findings of research by Tripa et al., [10] and Suma et al., [11].

Laborato nd ra logical findings in AES patients

V stud e available for the laboratory findings in ES pa s. The findings in our study being anemia (64.3%), ocyto (50%) and thrombocytopenia (35.7%) are in line w e previous study by Tripathy et al., [10]. Furthermore studies are required in this category for confirmation. The CSF dy shows pleocytosis in 36.4% and increased CSF protein is en in 54.5%. These findings are consistent with the study Tripathy et al., [10], Suma et al., [11] and Vasanthapuram et al., [12]. The abnormal MRI findings found in our study were parenchymal hyperintensity (66.66%) and diffuse cerebral edema (33.33%). The findings are similar to the study Tripathy et al., [10].

Conclusion

In conclusion, this study holds significant implications for the management and treatment of AES in tertiary care settings based on evidence. Reducing AES mortality and morbidity at tertiary care centers can be achieved through standardizing laboratory and diagnostic criteria and by being aware of the opportunities and constraints associated with handling AES cases. To effectively manage AES patients in India, a consistent model of care package across health care levels needs to be devised and put into practice. Furthermore, similar studies are required to gather more data for more evidence based practices.

References

1. Kakoti G, Das BR. Clinico-epidemiological characteristics of hospitalized acute encephalitis syndrome children and their correlation with case fatality rate. J Fam Med Prim Care 2020;9(12):5948-5953.
2. Banerjee B, Hafis M, Mahalingam A, Acahrya U. Acute encephalitis syndrome: Approach to a changing paradigm. Pediatr Infect Dis 2019;1(3):85-93.

3. Karmarkar SA, Aneja S, Khare S, Saini A, Seth A, et al. A study of acute febrile encephalopathy with special reference to viral etiology. Indian J Pediatr 2008;75(8):801-805.
4. Datta D, Karmakar BC. A six years prospective epidemiological study of acute encephalitis syndrome among children admitted in a rural tertiary care center. Int J Contemp Pediatr 2019;6(5):2125-2131.
5. Sarkar AH, Das BR. Sociodemographic and clinical profile of patients with acute encephalitis syndrome. Int J Scient Res 2017;6(4):1-8.
6. Khound M, Dowerah P. A hospital based observational study to find the correlation of the demographic profile and clinical features with the outcome in patients with acute encephalitis syndrome and to study the disease pattern in the population. J Dental Med Sci 2017;16(12):22-26.
7. Khinchi YR, Kumar A, Yadav S. Study of acute encephalitis syndrome in children. J Coll Med Sci Nepal 2010;6(1):7-13.
8. Basu R, Kalamuddin M. An epidemiological study on clinical profile and short term outcome in children of acute encephalitis syndrome in a tertiary care centre of West Bengal with special reference to the various prognostic markers. J Dental Med Sci 2018;17(2):14-19.
9. De S, Samanta S, Halder S, Sarkar P. Clinical profile and outcome of children admitted with acute encephalitis syndrome in a tertiary care hospital in West Bengal, India. 2015;11(11):1-8.
10. Tripathy Sandeep K, Pravakar M, Dwibedi B, Lipsa P, Das Rashmi R. Clinico-epidemiological study of viral acute encephalitis syndrome cases and comparison to non-viral cases in children from Eastern India. J Glob Infect Dis 2019;11(1):7-12.
11. Suma R, Netravathi M, Gururaj G, Thomas PT, S B, et al. Profile of acute encephalitis syndrome patients from South India. J Global Infect Dis 2023;15:15
12. Ravi V, Shafeeq Keeran SH, Ani D, ta S, Vijayalakshmi R, et al. Deng irus is a der-re nised causative agent of Acute Encep litis S me (AES): Results from a four year AES rveilla study of Japanese encephali of India dengue virus is an under-reco ized causa t J Infect Dis. 2019;84(S):S19-S24.

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