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COMPARISON OF CLINICAL PROFILE OF ADULT AND PEDIATRIC AES CASES

Community Medicine

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ABSTRACT

Introduction- Acute Encephalitis Syndrome is defined as the acute onset of fever and a change in mental status (including symptoms such as confusion, disorientation, coma or inability to talk) and/or new onset of seizures (excluding simple febrile seizures) in a person of any age at any time of the year. An accurate understanding of the demography, clinical profile and outcome of the AES patients in adults and children is needed.
Objectives- To study the difference in clinical profile and outcome between the adult and pediatric patients of Acute Encephalitis Syndrome.
Materials and methods- Hospital based observational study for one year in Jorhat Medical College, Jorhat, Assam.
Results- out of 169 AES cases 52.1% were adults and 47.9% were children. Higher incidence of seizure was found in children whereas higher incidence of irritability and headache in adult were found to be significant. Outcome at discharge showed that complete recovery was more in adults than in children (70% vs. 56.3%). Neurological sequalae was less in adult than children (15.6% vs. 6.8). Death had occurred less in adult (22.9%) as compared to children (28.1%).
Conclusion Adults and children both suffer from similar signs and symptoms but the severity of CNS involvement was found to be more in children.

KEYWORDS

AES, Acute Encephalitis Syndrome, Clinical profile, Neurological sequalae, CNS

Introduction

The history of Acute Encephalitis Syndrome (AES) began with the surveillance for Japanese Encephalitis (JE). Numerous outbreaks of JE occurred at different geographical locations in the world following the first outbreak in 1871 in Japan. Specific diagnosis of JE is resource intensive. Also, the management of JE does not differ from that of acute encephalitis. Considering the resource intensive nature of Japanese Encephalitis laboratory diagnosis and the seriousness of the disease, an expert committee on Japanese Encephalitis surveillance from World Health Organization in 2006 recommended syndromic surveillance for clinical detection of JE.[1]

Acute Encephalitis Syndrome, as the name suggests, is an umbrella term which includes a variety of etiologies that gives rise to a cluster of similar manifestations.[2-4] It has been defined by WHO as the acute onset of fever and a change in mental status (including symptoms such as confusion, disorientation, coma or inability to talk) and/or new onset of seizures (excluding simple febrile seizures) in a person of any age at any time of the year.[5]

This syndromic approach has been taken up globally and in India to diagnose cases clinically as AES first, irrespective of the causative organism. AES may be caused by a variety of agents which ranges from large number of neurotropic viruses to non-viral etiologies making specific diagnosis difficult.[6]

According to the reports published by National Vector Borne Disease Control Programme for the period from 1st Jan 2015 to 31st Dec 2015, the figures for AES in India and Assam are 9855 and 1409 cases respectively.[7]

AES is of particular interest as it has a high morbidity and mortality. Neurological sequalae is the most dreaded damage caused by AES. Earlier children were more affected than adults. This is a preventable disease with specific intervention. Hence an accurate understanding of the demography, clinical profile and outcome of the AES patients in adults and children is needed. It is a disease that causes high mortality and disability in the survivors[8]. Thus encephalitis can cause a great loss to public health, productivity and economy of a country. Hence the present study was conducted with the following research objective.

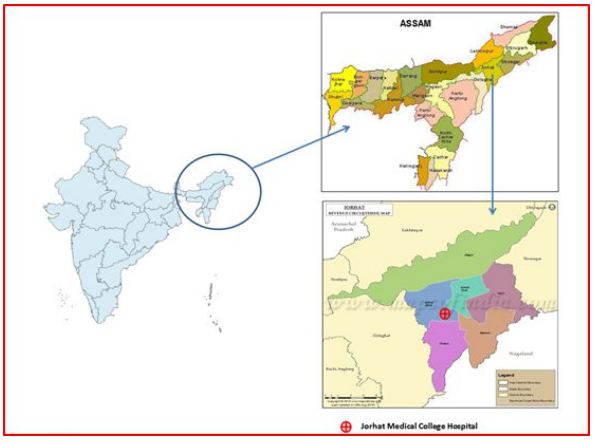
Aims and objectives

To study the difference in clinical profile and outcome between the adult and pediatric patients of Acute Encephalitis Syndrome.

Materials and Methods

The present Hospital based observational longitudinal study was conducted at Jorhat Medical College Hospital (26.7426° N, 94.1951° E) from 1st July 2015 to 30th June 2016 (one year).

Figure-1: Showing the map of study area



Inclusion criteria

1. Patients upto the age of 12 years who fulfilled the WHO case definition of Acute Encephalitis Syndrome and were admitted under the departments of Pediatrics of Jorhat Medical College Hospital.
2. Patients above 12 years of age who fulfilled the WHO case definition of Acute Encephalitis Syndrome and were admitted under Internal Medicine department of Jorhat Medical College Hospital.
3. Participants or caregivers (in case of cognitive orientation compromised patients or children) who were willing to participate and gave consent.

Exclusion criteria

Patients or guardians (in case of cognitive orientation compromised patients or minors) who were not willing to give consent for the study.

Sample size and sampling technique– All the consecutive cases of Acute Encephalitis Syndrome admitted under Internal Medicine and Pediatrics department from 1st July 2015 to 30th June 2016 who fulfilled the inclusion criteria.

Instrument for data collection- WHO AES reporting format was used for collection of data. Additional data were collected viz. socio-economic status, Glasgow Coma Scale score etc.

Informed consent- A written informed consent was obtained from all the patients or their guardians individually after explaining the purpose and the scope of the study. They were provided with a participant information sheet which detailed the nature and all other information pertaining to the research study. Assent was obtained from adolescents. Surrogate consent was taken from immediate relative (spouse> parents>sibling), incase the patient was not able to give consent. Later the patient was informed about the study in details and consent was taken if he/she became conscious and oriented. Informed consent forms were used in understandable language of the participants or their guardian. The patient or relatives were requested to sign or give Left Hand Thumb Impression whichever was applicable and comfortable to the patients or relatives.

Ethics clearance- Ethical clearance was obtained from the Institutional Ethics Committee (Human), Jorhat Medical College and Hospital, Jorhat.

Data collection technique- Admission registers in the departments of Internal Medicine and Pediatrics were actively searched on daily basis during the study period and cases admitted as Acute Encephalitis Syndrome were identified by applying the WHO AES case definition. Data were collected in the WHO AES case reporting format. It included particulars that were filled up following oral enquiry and clinical findings.

Data from Oral enquiry- After identification of Acute Encephalitis Syndrome cases the WHO AES case reporting format was used to obtain data on particulars of patients and the case specific details.

Clinical data- Clinical data were collected by clinical examination of the study subjects. Signs and symptoms, GCS score etc were recorded
Statistical analysis- the data collected were entered in Microsoft Excel 2010 and analyzed using Epi info version 7 for Windows which was downloaded free from the website of Centre for Diseases Control and Prevention (CDC), Atlanta. Statistical significance was considered at 95% confidence interval that is when p value was less than 0.05.

Operational definitions
Acute Encephalitis Syndrome- WHO has defined a case of Acute Encephalitis Syndrome as a person of any age, at any time of year with the acute onset of fever and a change in mental status (including symptoms such as confusion, disorientation, coma, or inability to talk) and/or new onset of seizures (excluding simple febrile seizures). Other early clinical findings may include an increase in irritability, somnolence or abnormal behaviour greater than that seen with usual febrile illness[9].

Children/ pediatric age- Population admitted with Acute Encephalitis Syndrome who belonged to age group of less than or equal to 15 years (inclusive) of age

Adult- Population admitted with Acute Encephalitis Syndrome who belonged to age group of more than 15 years (exclusive) of age.

Outcome- Outcome was considered in three categories viz. complete recovery, recovery with neurological sequelae and death. The outcome for individual patient was recorded at the time of discharge or death.

Neurological sequale- Neurological sequelae was defined by the presence of one or more of the following at the time of discharge; impaired consciousness, weakness (monoparesis, hemiparesis, and quadriparesis), focal or generalized abnormal limb tone (hypertonia and hypotonia), focal or generalized abnormal limb reflexes (hyperreflexia and hyporeflexia), diagnosis of new onset or recurrent seizures, or new or recurrent extra pyramidal movement disorders[10].

Results

Demographic profile of Adult and children with AES
In our study we enrolled 169 AES cases of which 52.1% were adults (>15 years of age) and 47.9% were children (≤15 years of age). Among adults 54.5% were male and 45.5% were female. In children 53% were male and 47% were female AES cases (Table-1). The mean age for AES in adults was 43.6 ± 17.4 years and that for children was 6.9 ± 3.9 years.

Table-1 Demographic profile of adult and children AES cases

Age group	AES cases (n=169)	Percentage of AES (%)
Children (≤15)		
Male	43	53
Female	38	47
Total	81	47.9
Adult (>15)		
Male	48	54.5
Female	40	45.5
Total	88	52.1
Grand Total	169	100

Clinical profile of children and adult hospitalized with AES
In the present study it was seen that fever (100%), change in mental status (100%), seizure (69.1%), neck rigidity (45.6%) and headache (45.6%) were the most common clinical presentation in children. On the other hand, fever (100%), change in mental status (100%), headache (79.5%), and irritability (55.6%) were the most common symptoms of AES in adults.

Higher incidence of seizure in children was found to be statistically significant ($p<0.05$). Also, higher incidence of irritability and headache in adult were found to be statistically significant ($p<0.05$). Over all signs related to CNS involvement viz. unconsciousness and seizure were more in children. (Table-2).

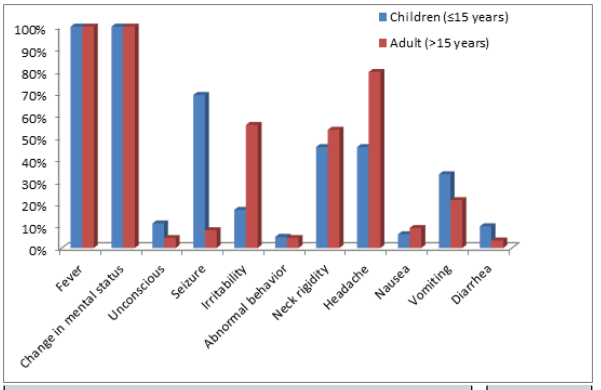
It was seen in the present study that 35.8% children with AES had a GCS score of less than or equal to 8. However, only 12.5% of adults presented with a GCS score of less than or equal to 8 (Table-2). This difference GCS score was found to be statistically significant ($p<0.05$). The average duration in hospitalization after onset of symptoms was 2.8±1.6 days for children and 3.5±1.9 days for adult.

Table-2: Comparison of clinical signs and symptoms between children and adult with AES

Clinical signs and symptoms*	Number of children(≤15 years) with AES (n=81)	Number of adult(>15 years) with AES (n=88)	P value
Fever	81 (100%)	88 (100%)	>0.05
Change in mental status	81 (100%)	88 (100%)	>0.05
Unconscious	9 (11.1%)	4 (4.5%)	>0.05
Seizure	56 (69.1%)	7 (8%)	<0.05
Irritability	14 (17.2%)	49 (55.6%)	<0.05
Abnormal behavior	4 (5%)	4 (4.5%)	>0.05
Neck rigidity	37 (45.6%)	47 (53.4%)	>0.05
Headache	37 (45.6%)	70 (79.5%)	<0.05
Nausea	5 (6.2%)	8 (9%)	>0.05
Vomiting	27 (33.3%)	19 (21.6%)	>0.05
Diarrhea	8 (9.8%)	3 (3.4%)	>0.05
GCS score GCS≤8	29 (35.8%)	11 (12.5%)	<0.05
GCS>8	52 (64.2%)	77 (87.5%)	

*multiple response

Figure-2: Comparison of clinical signs and symptoms between adult and children with AES

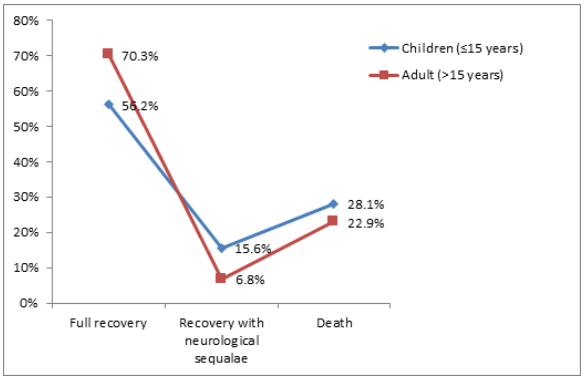


Outcome of adult and children with AES

In the current study it was observed that out of the total 169 AES cases, 37 cases left the hospital against medical advice and 4 were referred to higher centers for better case management. We could not do the outcome analysis of 41 patients who left the hospital or were referred. The outcome analysis was done for 138 AES cases. Among these 138 AES cases 64(46.3%) were children and 74 (53.6%) were adults.

Comparison of outcome at discharge showed that complete recovery was more in adults than children (70% vs. 56.3%). Neurological sequalae was less in adult than children (15.6% vs. 6.8). Death had occurred less in adult (22.9%) as compared to children (28.1%). However, these difference in outcome was not found to be statistically significant (p>0.05).

Figure-3 Comparison of outcome between adult and children AES cases



Discussion

Age distribution

In our study we found that adults (>15 years of age) were more affected than children (≤15 years of age). There is increasing evidence of occurrence of JE in older age group in recent times. This has occurred in many places where mass vaccination was carried out in children below 15 years of age[11].

Sex distribution

Both in adult and pediatric age group male were more affected by AES than female. Similar results were observed by Malakar M et al. [12]. This may be due to the more preponderance of JE as a cause of more AES in male. However, to confirm further conclusive studies are required.

Clinical profile of children and adult cases with AES

In the present study it was seen that fever (100%), change in mental status (100%), seizure (69.1%), neck rigidity (45.6%) and headache (45.6%) were the most common clinical presentation in children. On the other hand, fever (100%), change in mental status (100%), headache (79.5%), and irritability (55.6%) were the most common symptoms of AES in adults. Over all signs related to CNS involvement viz. unconsciousness and seizure were more in children. These findings were similar to the observations made by Malakar M et al. [12], Borah J et al. [13] and Lowry PW et al. [14].

Features of more CNS involvement in children may be explained by the fact that children were unable to withstand the acute stress of encephalitis as compared to adults.

It was seen in the present study that 35.8% children with AES had a GCS score of less than or equal to 8. On the other hand, only 12.5% adults presented with a GCS score of less than or equal to 8. From this finding we may conclude that CNS involvement is more severe in children in comparison to adult.

The average duration in hospitalization after onset of symptoms was 2.8±1.6 days for children which was slight lower than the adults with 3.5±1.9 days. Our observation may be due to higher numbers of presenting warning signs like seizure and unconsciousness as compared to adults. Caregivers/mothers are more worried when their children become ill and thereby seek health care early in comparison to adults.

Outcome of adult and children with AES cases

Comparison of outcome at discharge showed that complete recovery was more in adults than children, neurological sequale was less in adult than children. Death had occurred less in adult as compared to children.

An earlier study observed similar findings [13]. The lower mortality and neurological sequale in adult may be due to the fact that adults might have been exposed to the disease agents at an earlier age. This exposure might have conferred some kind of immunity with memory cell still retained from the earlier immunological assault.

Conclusion

Acute Encephalitis Syndrome is a major public health problem prevalent in this part of the country. Adults and children both suffer from similar signs and symptoms but the severity of CNS involvement was found to be more in children. Complete recovery at discharge was more in adults but death and recovery with neurological sequale was more among children. The policy maker should initiate appropriate public health intervention to control this dreaded disease of mankind.

Limitations of the study

This study was a hospital based study and hence the results cannot be entirely applied to general population. Cases admitted to health institutions other than Jorhat Medical College Hospital were not included in this study and hence there is a possibility of missing those cases.

Patients who were referred to higher centers and who left against medical advice could not be followed up for outcome. So these cases were excluded from outcome analysis.

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Conflict of interest- none

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