

Sociodemographic and Clinical Profile of Patients with Acute Encephalitis Syndrome



Community Medicine

KEYWORDS: Acute Encephalitis Syndrome, AES, clinical profile, neuropsychiatric sequelae

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ABSTRACT

Background- Acute Encephalitis Syndrome (AES) is a condition that affects the human brain and causes high morbidity and mortality.

Objective- To study the socio-demographic and clinical profile of patients admitted with Acute Encephalitis Syndrome in Internal Medicine and Pediatrics department of Jorhat Medical College Hospital.

Materials and method- Hospital based observational study for one year in Jorhat Medical College, Jorhat, Assam.

Results- The mean age of patients with AES was 26±22 years with a range of 6 months to 85 years. Male were affected more. 93.5% belonged to Hindu religion and were from rural area belonging to Class IV socio economic status. Fever, change in mental status and headache were the most common symptom. AES was found to have a perennial occurrence with a peak in July. Most of the AES cases recovered completely (64%), followed by death (25%) during hospital stay and a few developed neuropsychiatric sequelae (11%).

Conclusion- AES is a significant public health problem in the study area with high morbidity and mortality and warranted public health interventions.

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 sequelae is the most dreaded damage caused by AES. It is the adults who are most productive and neurological deficits leave them with less productivity. This is a preventable disease with specific intervention. Hence an accurate understanding of the demography, clinical profile and outcome of the AES patients 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.

OBJECTIVE:

To study the socio-demographic and clinical profile of patients admitted with Acute Encephalitis Syndrome in Internal medicine and Pediatrics department.

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).

Inclusion criteria

1. Patients who fulfilled the WHO case definition of Acute Encephalitis Syndrome and were admitted under the departments of Pediatrics and Internal Medicine of Jorhat Medical College Hospital.
2. 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), in case 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].

Outcome- Outcome was considered in three categories viz. complete recovery, recovery with neuropsychiatric 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

Sociodemographic profile of AES cases

Current analysis of socio-demographic profile has shown that there were 53.9% male and 46.1% female AES patients. The highest percentage of AES cases (52.6%) was recorded among patients more than 15 years of age. Among children the mostly affected age group was 5-15 years (32%). The mean age of all the AES cases was 25.6 ± 22 years for male, 26.4 ± 22 years for female and 26 ± 22 years overall. The difference of mean ages between male and female was not found to be statistically significant. It was seen that AES occurred among all age groups. The range was from 6 months to 85 years of age. Out of 169 AES cases, 83.4% belonged to rural areas while 16.5% were from urban areas (Table-1).

Table-1: Sociodemographic profile of AES cases

Age group (years)	Number of AES cases (n=169)						Total (%)
	Male			Female			
	Urban	Rural	Total (%)	Urban	Rural	Total (%)	
<1	1	3	4(4.4)	1	0	1(1.2)	5(3)
1-5	2	9	11(12.1)	1	9	10(12.8)	21(12.4)
5-15	3	25	28(30.7)	1	25	26(33.3)	54(32)
15-30	4	8	12(13.1)	1	8	9(11.5)	21 (12.4)
30-60	6	19	25(27.5)	4	18	22(28.2)	47(27.8)
>60	2	9	11(12)	2	8	10(12.8)	21(12.4)
Total	18	73	91(53.9)	10	68	78(46.1)	169(100)

Religion wise distribution of the AES cases showed that 93.5% (majority) of the cases were Hindus, followed by 6% who were Islam and 0.5% were Christian. It was seen that out of 169 AES cases, maximum (69.2%) belonged to the Lower middle socio economic class (Class IV) according to modified BG Prasad Scale. It was found that upper and upper middle socioeconomic class were affected less (2.9%) in comparison to middle and lower middle class (95.2%). This was found to be statistically significant (p<0.05).

Clinical profile of AES cases

Assessment of clinical signs and symptoms showed that fever and change in mental status was present in 100% of the AES cases followed by headache in 63.3% and neck rigidity in 49.7%. There were 37.3% AES cases with history of seizure, 37.3% had irritability, 27.2% had vomiting, 7.7% had nausea and 7.7% were unconscious. Some of the AES cases had diarrhea and abnormal behavior (Table-2).

It was seen in the present study that 76.3% of AES cases had a GCS score of more than 8 and 23.7% had a GCS score of less than or equal to 8 (Table-2).

The maximum percentage (24.3%) of AES cases were admitted after 3 days from onset of symptoms. The average duration between hospitalization and the onset of symptoms was 3.16±1.8 days with a minimum 0 days to a maximum of 12 days.

Table-2: Clinical signs and symptoms of AES cases

Clinical signs and symptoms*	Number of AES patient (n=169)	Percent age (%)
Fever	169	100
Change in mental status	169	100
Unconscious	13	7.7
Seizure	63	37.3
Irritability	63	37.3
Abnormal behavior	8	4.8
Neck rigidity	84	49.7
Headache	107	63.3
Nausea	13	7.7
Vomiting	46	27.2
Diarrhea	11	6.5
GCS score GCS≤8	40	23.7
GCS>8	129	76.3

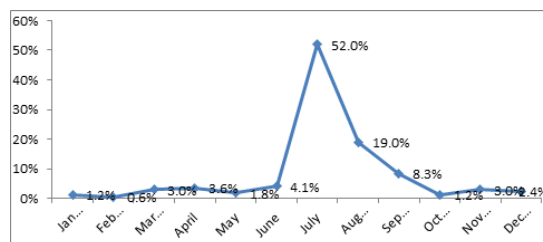
*multiple responses

Geographical distribution of AES cases

It has been observed that AES cases from different districts of upper Assam were admitted to Jorhat Medical College Hospital during the study period. Out of a total of 169 AES cases, 60.9% were from Jorhat, 33.7% from Golaghat, 3.5% from Sivasagar, 1.2% from Karbi Anglong and 0.6% were from Lakhimpur district. The mostly affected district was Jorhat.

Month wise occurrence of AES cases In the current study it was revealed that there is perennial occurrence of AES cases with a peak in the month of July. Moreover, cases occurred mostly from June to October (Figure1).

Figure-1: Line diagram of AES cases month wise

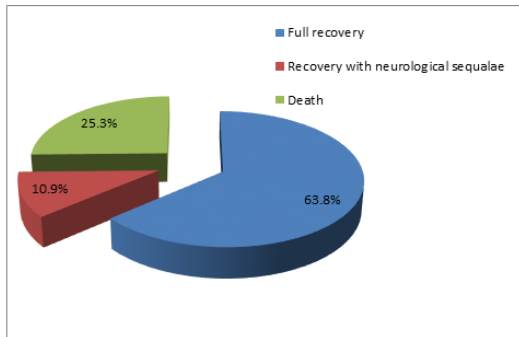


Outcome of AES

In the present study it was seen that out of 169 AES cases, 37 cases left the hospital against medical advice and 4 were referred to higher centres. Hence the outcome could be observed for 138 cases. Among the 138 AES cases, 63.8% (majority) were discharged after complete recovery, 10.9% suffered from neuropsychiatric sequelae and 25.3% died during their stay in the hospital (Figure-2).

Multiple Logistic regression was done taking outcome as dependent variable and GCS score at admission and the delay in hospitalization as independent variable. It showed that there is a significant association between low GCS score and mortality ($p < 0.05$).

Figure-2: Depicting the outcome of AES cases



Discussion

Sociodemographic profile of AES cases

In the present study it was found that the percentage of AES case was more in male (53.9%) than female (46.1%) (Table-1-). Similar observations were also made in earlier studies [11-14].

Maximum percentage of AES patients were recorded in the patients more than 15 years of age with mean age of 26 ± 22 years (Table-1). This was found to be similar to the findings of study conducted in past [15]. In our study all the age groups were affected and maximum percentage of AES was recorded in patients above 15 years of age.

It was observed that most of the AES cases were from rural areas. This finding is similar to other earlier studies [14,16]. The people in rural are affected more because of transmission dynamics of Japanese Encephalitis which is the cause of most AES.

Clinical profile of AES cases

Current study revealed that the most common symptoms of AES cases were fever, change in mental status, headache and neck rigidity (Table-2). Shahi RK et al. [17], Deuri A et al. [14] found that fever was the most common symptom of AES. However, occurrences of other symptoms were not similar in all the studies [14,17]. This difference in clinical features may be due to the fact that AES is caused by many agents and accordingly the clinical signs and symptoms may vary.

It was observed in our study that the average duration of time from onset of symptoms to the admission was 3.16 ± 1.8 days. This was less than that observed by Kakkar M et al. [18] and Kakoti G et al [19]. The difference may be due to the increased awareness of the people regarding AES and JE which motivated the patients to report for early hospitalization.

Geographical distribution of AES cases

In the current study it was seen that AES cases were mainly from Jorhat and other neighbouring districts. Since the institution where the present study was conducted is a tertiary health care institution, so there were AES cases which were referred from other neighbouring districts for better case management.

Month wise occurrence of AES cases

A perennial transmission trend was observed with majority of the AES cases admitted in the month of July followed by August,

September and June (Figure-1). Similar observation was made by Borkotoki U et al. [20] and by Deuri et al. [14] in their studies. This may be explained by the fact that AES may be caused by many etiological agents. As maximum rainfall occurs in this part of the country from June to August so JE transmission increases during the rainy season causing a sharp increase in JE and thereby AES cases.

Outcome of AES

Outcome analysis was done for 138 cases. It was seen that maximum (63.8%) AES cases recovered completely which was similar to the findings of earlier studies [14,17]. It was also observed that 10.8% of the AES suffered from neuropsychiatric sequelae and 25.3% of the AES cases died during their stay in hospital (Figure-2). Similar observations were made by Khinchi YR et al. [2] and De S et al. [16]. High mortality rate in AES may be due to delay in hospitalization, poor case management and non availability of specific antiviral treatment against Japanese Encephalitis.

Conclusion

AES is a significant public health problem in the study area with high morbidity and mortality. It requires further research and warrants public health interventions.

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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