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Clinical Profile and Outcome of Patients Diagnosed with Japanese Encephalitis in a Tertiary Care Hospital in Upper Assam

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Abstract
Japanese Encephalitis (JE) is one of the major public health problem in Assam and northeast India, owing to its high mortality rate and significant neurological involvement. This is a hospital based retrospective study conducted from July 2022- December 2022 in the Pediatrics Department of Jorhat Medical College. A total of 43 cases diagnosed with Japanese Encephalitis were studied for their clinical profile and immediate outcome. of the 124 patients admitted with Acute Encephalitis Syndrome, 43 (34%) were diagnosed as JE with a male preponderance of 67%. Fever (100%), change in mental status (100%), headache (34%),seizure (72%) were the common clinical findings. Majority of the cases belonged to rural area (81%). The overall Case Fatality was 11.6%. Neurological sequalae (aphasia and motor deficits) was seen in 34% of recovered cases. The study reflected a considerable burden of JE in Assam with prevailing environmental characteristics indicating adaptation of effective measures to minimize disease transmission.

INTRODUCTION

Acute Encephalitis Syndrome (AES) is defined as acute onset of fever, with a change in mental status (including confusion, disorientation, coma or inability to talk) and or new onset of seizures (excluding simple febrile seizures) in a person of any age[1]. It is a group of clinical symptoms and signs, used by the World Health Organization (WHO) for surveillance purposes, to screen patients with viral encephalitis, including Japanese encephalitis (JE). Viruses are regarded as the most important cause of encephalitis worldwide. However, encephalitis can also be caused by bacteria or parasitic infections, as well as immune mediated processes in the brain. Specific etiological agents differ considerably depending on geographical location and age[2]. In recent times, especially after 2012, AES cases in India have shifted towards the JE aetiology. Based on reports, Indian states of Uttar Pradesh (UP), Bihar, Assam, West Bengal and Tamil Nadu were identified as JE endemic zones[3]. Among all the identified causes of AES, JE is the most commonly identified cause in about one third of the AES cases[4]. In India, JE was identified as a public health problem since 1952 and in Assam since 1978 and since then there has been a number of outbreaks[5]. Geographically and culturally, Assam has all the mosquito genic factors in abundance required for JE transmission. There is agricultural practice which is dependent on rain based irrigation. In Assam, the culture of pig rearing is practiced and there is abundance of vector (Culicine mosquito) responsible for transmission of JE. Recently, there is an increasing incidence in last 5 years(2018-2022),claiming a total of 442 patients out of 2145 cases. A recent outbreak reported (July 1-September 23,2022) a total of 434 cases in 17 separate districts within Assam, with a CFR -21.43%[6]. The present study was undertaken to review the different parameters with their changing trend related to JE in terms of age, sex, geographical location, vaccination status, clinical presentation and seasonal variations within a period of 6 months.

Aims and Objectives:

- To elucidate the clinical and demographic profile of patients diagnosed with Japanese Encephalitis admitted into the Department of Pediatrics, JMCH.
- To determine the immediate outcome of the disease and burden of residual neuropsychiatric damage among the survivors.

MATERIALS AND METHODS

The present study is a hospital based retrospective study of patients admitted with a diagnosis of Japanese Encephalitis into the Department of Pediatrics, JMCH during the time period of 6 months ((01/07/2022-31/12/2022). Ethical Committee clearance have been taken.

Inclusion Criteria: All the hospitalized patients where cerebrospinal fluid and serum sample were tested positive for JEV specific IgM antibodies by MAC ELISA admitted during the study period in Pediatrics department of Jorhat Medical College.

Exclusion Criteria:

- Patients with pre existing neurological deficit prior to the onset of disease.
- Neonates (from birth to 28 days of life).

RESULTS AND DISCUSSIONS

Out of 124 AES cases admitted during the study period, the case records of 43 diagnosed cases of JE were analysed based on age, sex, geographical location, vaccination status, seasonal variation, clinical presentation and outcome.

Out of 124 cases of AES,43 cases (34.6%) are of JE etiology as shown in Table 1.

The clustering of cases are mostly seen in rainy seasons of July and August as shown in Table 2

The commonest age group of presentation is 5-12 year(53%),followed by 1-5 year(30%).

Out of 43 patients,29 (67%) were male and 14(33%) were female with male preponderance as shown in Table 4.

Cases are mainly from the rural areas(88%),out of which the neighbouring districts of Sivsagar have the highest case(36%),followed by Golaghat(31%) and Jorhat(31%) districts.

Among the clinical presentation, Fever (100%), change in mental status(100%),headache(34%),seizure (72%) were the major clinical findings. Diarrhea can be seen in a significant number of cases (23.2%) as shown in Table 6.

Out of 43 cases,5 died(11.6%) and 15 cases(34.8%) recovered with neurological sequelae.The remaining cases 23(53.4%) discharged without a neurological sequelae.

Aphasia(40%) and motor deficit(40%) followed by behavioral disorders(13.3%) and cranial nerve palsy (6.6%) are the commonly encountered neurological sequalae among the survivors.

Out of the non vaccinated cases, (71%) expired which attributes to the total 5 cases of mortality.

Out of the vaccinated cases,23 cases (63.8%) recovered without a neurological sequelae.

Out of 5 cases.4 cases (80%) had a GCS score below 8 at the time of admission.

Average gcs score at the time of admission is 12-14(58.1%), followed by 9-11(23.2%) as shown in table 12.

The study shows a high JE positivity amongst AES cases (34%) signifying the gravity of the scenario. It also highlights the association of JE with different

parameters such as age(mainly affecting the older age group),season(clustering of cases in the monsoon) and geographical location(mainly prevalent in rural area).The clinical features observed in the study are not uniform in all JE cases. Individual variations might be due to influences of host immune status, viral load,

The commonest age group at presentation was 5-12 years(53.49%),with a male preponderance of 67%,similar to study shown at Kumar[7]

The distribution of cases are seen more during rainy seasons clustering more in the rural area similar to the study done by Medhi[8] Among the clinical presentation, Fever (100%),change in mental status(100%),headache(34%),seizure (72%) were the major clinical findings similar to study done by Medhi *et al.* One of the significant findings on presentation

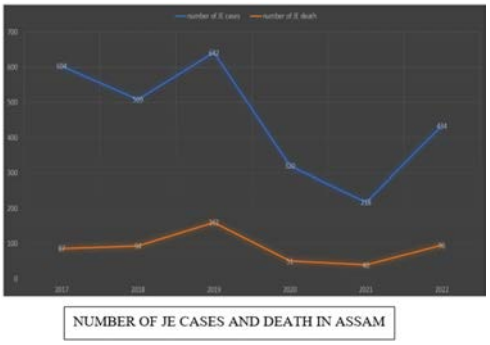

Fig. 1: Number of JE Case and Death Assam

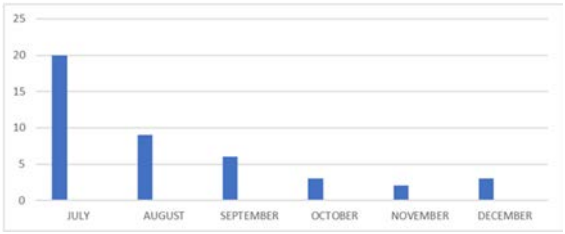

Fig. 2: Seasonal variations of the je cases(n=43)

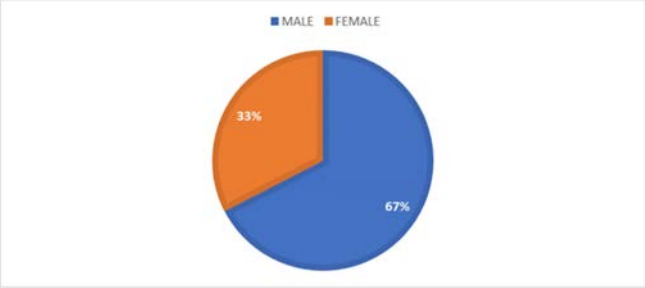

Fig. 3: Distribution of cases according to sex(n=43)

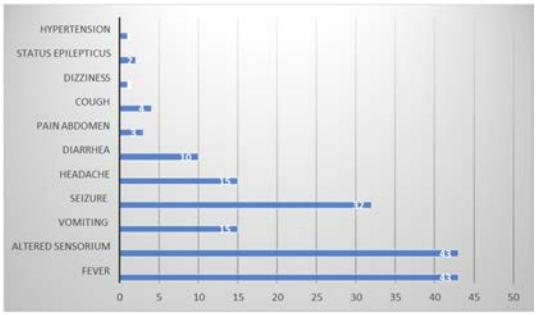

Fig. 4: Distribution of cases according to clinical presentation

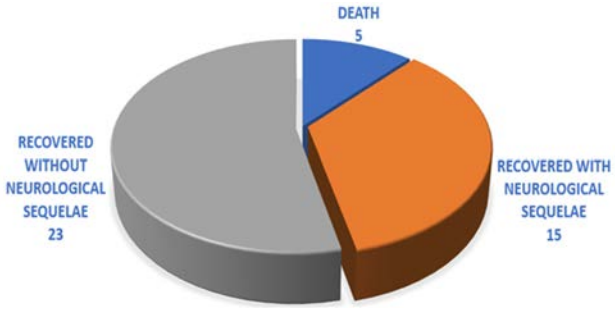

Fig. 5: Outcome of the cases(n=43)

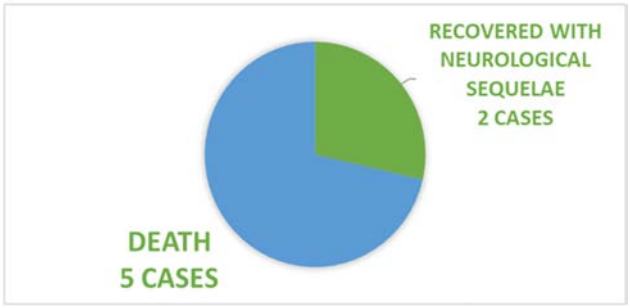

Fig. 6: Outcome of the non -vaccinated cases(n=7)

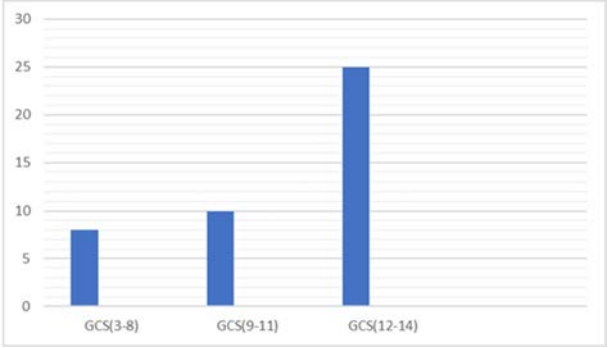

Fig. 7: Distribution of cases according to gcs score at the time of admission

Table 1: Distribution of JE cases among AES patients (n=124)

Total cases	Number
Je cases	43
Non-je cases	81

Table 2: Distribution of cases according to age(n=43)

AGE	Number of cases
1 Month-1 Year	7
1 Year-5 Year	13
5 Year-12 Year	23

Table 3: Distribution of cases according to geographical location(n=43)

Location	
Rural	38
Urban	5 (Jorhat district)
Locality in Rural area	**Number of cases**
Sivsagar	14
Jorhat	12
Golaghat	12

Table 4: Types of neurological sequelae(n=15)

Types of neurological sequelae	Total number of cases
Aphasia	6
Motor deficit	6
Cranial nerve palsy	1
Behavioural disorders	2

Table 5: Status of vaccination among the je cases(n=43)

Status of vaccination	Total number of cases
Vaccinated	36
Non-vaccinated	7

Out of 43 cases,a majority (83.7%) are vaccinated.

Table 6: status of morbidity among the vaccinated cases(n=36)

Outcome	Number of cases
Recovered with neurological sequelae	13
Recovered without neurological sequelae	23

Table 7: Distribution of mortality with gcs score at the time of admission

Gcs score	
3-8	4
9-12	1
13-15	0

was diarrhoea (23%). The overall case fatality rate was 11.6% which is less compared to that reported by Medhi *et al.*(14.94%)[8]. 34% of the cases recovered with neurological sequelae in the form of motor deficits, aphasia, behavioral disorders and cranial nerve palsies. In the present study, 83% of the cases were length of the time between onset of disease and medical intervention. vaccinated, of which 63% cases recovered without any neurological sequelae. Out of 17% of non-vaccinated patients, 72% died which attributes to the total mortality of our study and remaining 28% recovered with a neurological sequeale. Similar presentation of morbidity profile can be seen in the study done by Kakoti[9] Average GCS score at the time of presentation was 12-14(58%),which is in discordance with a study done by Kakoti *et al.* which showed an average GCS score<8 (40.29%) at the time of presentation[9]. Among the expired patients 80% belong to the GCS score <8 score.

CONCLUSION

The study reflected a considerable burden of JE in Assam with prevailing environmental characteristics indicating urgent need to adopt effective measures to minimize disease transmission. This may include identifying targets for immunization and implementing appropriate control measures especially in outbreak situations and formulation of other public health measures. The case management and referral system should be improved to avoid any complication and mortality.

Limitations of Study: This study was a hospital based retrospective study with limited time period and sample size. The patients admitted into hospitals other than Jorhat Medical College although belonging to the same study area were not included in our study. Therefore, our findings cannot be extrapolated to the general population of this region. Serological cross reactions are common within the flavivirus which may give a false positive antibody result for Japanese encephalitis leading to false grouping as laboratory confirmed Japanese Encephalitis.

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