ISSN: 2091-2331 (PRINT) 2091-234X (ONLINE)

Journal of Nobel Medical College
Available Online: www.nepjol.info, www.nobelmedicalcollege.com.np
Volume 5, Number 2, Issue 9, Aug.-Dec. 2016, 43-46

Original Article

Neurological Sequelae in Acute Encephalitis Syndrome one month post discharge from the hospital in the Children Aged 1-14 years

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Received:28th September, 2016; Revised after peer-review: 26th October, 2016; Accepted: 12th October, 2016

Abstract

Introduction

Encephalitis is a complex clinical syndrome of the central nervous system (CNS) associated with fatal outcome or severe permanent damage including cognitive impairment, behavioral impairment and epileptic seizures. It is important to understand the clinical spectrum and outcome of acute encephalitis syndrome(AES) at local level to better define problem and to draw inferences for management and policy formulation.

Material and Methods:

This study was a hospital based observational, longitudinal and descriptive study conducted at Department of Pediatrics; Nobel Medical College Teaching Hospital, Biratnagar. Seventy cases with a diagnosis of AES (irrespective of the underlying etiology), were studied over a period of one year. All cases from 1 to 14 years of age fulfilling the standard WHO case definition of AES were included in the study. A pre-designed semi-structured questionnaire was being used to obtain the clinical profile and investigations. The cases were followed after one month post discharge from the hospital and the outcomes were recorded.

Results:

On follow up of the cases at the end of 1 month, 35 (50.7%) cases were found to have complete cure and were labelled as cured. Neurological sequelae were seen in 8(11.6%) cases and were labeled as not cured. Total death was documented in 26(37.7%) of the cases.

Conclusion:

Despite of early diagnosis and aggressive treatment neurological sequelae is not uncommon in AES. So, regular follow up and early rehabilitative efforts should be instituted for all cases of AES post discharge from the hospital.

Keywords: *Fever, Altered sensorium, Acute encephalitis syndrome, Neurological Sequelae.*

Introduction

Encephalitis is a clinical syndrome of the central nervous system (CNS) associated with fatal outcome or severe irreversible damage including cognitive and behavioral impairment and epileptic seizures. It is often acute, although symptoms may progress with rapid onset, causing severe debilitation to patients including otherwise healthy children [1]. AES may manifest as encephalitis, meningoencephalitis or meningitis. A hospital based study conducted in Dharan showed mortality of 8.3% and neurological sequelae of 50% among the AES cases [2].

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WHO defines AES as an acute onset of fever and a change in mental status (including symptoms such as confusion, coma, disorientation or inability to talk) and/or new onset of seizures (exception of simple febrile seizures) in a person of any age at any time of year [3]. Acute encephalitis can be caused by several conditions, including bacterial or viral infection in the brain, complication of an infectious disease, ingestion of toxic substances and complication of an underlying malignancy. Hence differentiating encephalitis from other similar conditions continues to be a challenging task. Infection of the CNS is considered to be the major cause of encephalitis and more than hundred different pathogens have been recognized as causative organism among which Japanese encephalitis being one quarter of all diagnosed cases of encephalitis [1]. Japanese encephalitis, Herpes simplex, Arbo viruses, Epstein barr virus, Enteroviruses, Influenza, Adeno virus, Varicella-zoster, Nipah virus, Echo virus, Rhabdo virus, Mycoplasma pneumonia are the most frequent pathogens but Varicella zoster, and Enteroviruses like Polio virus, Coxsackie have increased in incidence and occur more in younger age groups [4]. Neurological sequelae in JE are the common observation. Neurological sequelae were defined by the presence of the following at discharge; impaired consciousness, weakness characterized by either monoparesis, hemiparesis, or quadriparesis, focal or generalized abnormal tone, focal or generalized abnormal reflexes, diagnosis of new onset or recurrent seizures, or new or recurrent extra pyramidal movement disorders.

Materials and Methods

The Study was conducted in the Department of Pediatrics at Nobel Medical College and Teaching Hospital, Biratnagar, Nepal from May 2014-April 2015 for a period of one year. All the pediatric patients of age group 1-14 years fulfilling the WHO criteria for acute encephalitis syndrome were enrolled in the study.

A complete evaluation of the patient was done with detailed history and clinical examination, with a special focus on symptoms and signs of acute encephalitis syndrome. All the relevant informations were documented on pre-designed semi-structured questionnaires

A thorough clinical examination was done with a special attention on neurological system. The signs of meningeal irritation was examined with examination of nuchal rigidity, kernig sign and brudzinski sign.

Extrapyramidal features in the form of dystonia, dyskinesia and any other movement disorders were noted. Any form of neurological deficit after detail neurological examination was noted.

To identify variables associated with complete recovery and sequelae at the time of discharge and sequelae at 6 weeks were set as dependent variables and all others as independent variables. Data were analysed first using univariate regression analysis.

Results

Majority of cases (37)52.9% in our study were discharged without neurological sequelae. Twenty-one (30%) cases expired. One month follow up assessment was done after one month of discharge. Parents were contacted by telephone and invited to re-attend the hospital. On follow up of the cases at the end of 1 month, (35)50.7% cases were found to have complete cure and were labeled as cured. Neurological sequalae were seen in (8)11.6% cases and were labeled as not cured. Total death was documented in (26)37.7% cases and 21.13% patients had neurological sequelae at the time of discharge. On follow up of the cases at the end of 1 month, (35)50.7% cases were found to have complete cure and no

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mortality was documented among the follow up cases.

In our study neurological sequelae in the form of left sided hemiparesis in (4)50% cases,quadriparesis in (2)25% cases and seizure disorder in (2)25% cases. Association of focal neurological deficit and extrapyramidal features with neurological sequelae have not been reported in our study.

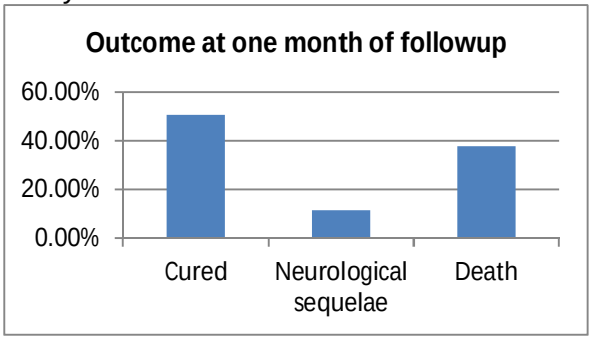

Figure 1: Outcome at 1 month of follow up

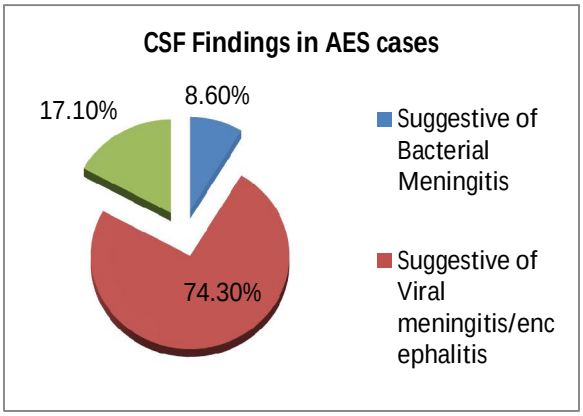

Figure 2: CSF findings in AES cases

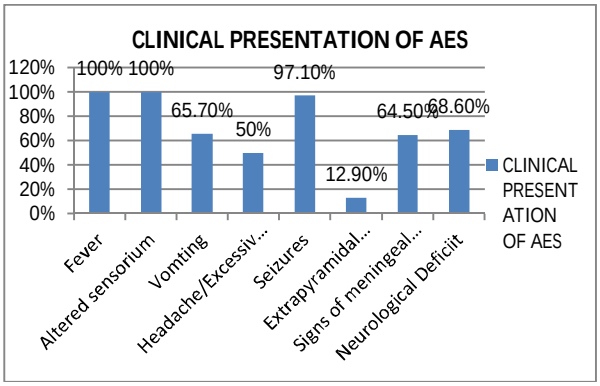

Figure 3: Clinical presentation of AES

Discussion:

Acute encephalitis is a major public health problem and treating pediatricians should be aware that patients with AES of unknown viral etiology also have a high risk of morbidity and mortality [5].Our study showed that AES affected all age group from children to adolescence. The mean age of the case was 6.59 (± 3.831) years. There was higher incidence of AES in males i.e (48) 68.6% as compared to female which was only (22) 31.4%.

The long-term outcome of encephalitis in children has not been well characterized; however, the evidence is concerning for high rates of neurocognitive and behavioural sequelae. A study from Finland showed cognitive and personality problems in over half [6] and an Israeli study showed moderate to severe sequelae in 63% of children with high rates of behavioural problems; low IQ scores, attention deficit hyperactivity disorder and learning disorders were over represented [7]. In our study, neurological sequelae in the form of left sided hemiparesis in (4)50% cases, quadriparesis in (2)25% of the cases and seizure disorder in (2)25% cases.

In contrast other studies had shown right sided hemiparesis more common [2, 8]. Hemiparesis was the most common neurological sequelae found in our study.

In our study, none of the symptoms were significantly associated with mortality at discharge. Presence of signs of meningeal irritation was not found to be statistically significant similar to results observed in study kakoli et al [9].

In contrary to this, the study conducted by Avabratha et.al. in Bellary, Karnataka, revealed association between mortality and meningeal signs [10]. There were 7 cases(10%)of postencephalitic epilepsy in a study done by Fowler et al [6] which showed epilepsy as one of the most important sequelae seen in AES cases as seen in our study.

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Association of focal neurological deficit and extrapyramidal features with neurological sequelae has also been reported in few studies which was not present in our study [5]. On follow up of the cases at the end of 1 month, (35)50.7% cases were found to have complete cure and were labelled as cured. Neurological sequelae were seen in (8)11.6% cases and were labelled as not cured.

Conclusion

To conclude, although AES is associated with high rates of mortality and debiliating neurological sequelae, early diagnosis and aggressive treatment, timely follow up, early institution of rehabilitative care and holistic approach from the family and medical personnels, a complete vocational cure can be attained as seen from our study.

However, to better understand the clinical presentation, outcome and the association of clinical profile with the outcome, we need more of multicentric, randomized clinical trial.

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