Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL11, ISSUE2, 2020

Original Research Article

To study acute febrile encephalopathy in children in terms of the different infectious etiology

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Abstract

Background & Methods: The aim of the study is to study acute febrile encephalopathy in children in terms of the different infectious etiology. Acute febrile encephalopathy (AFE) is a clinical term used to an altered mental state that either accompanies or follows a short febrile illness and is characterized by a diffuse and nonspecific brain insult manifested by a combination of coma, seizures, and decerebration.

Results: The chi-square statistic is 0.5305. The *p*-value is .046394. The result is significant at $p < .05$. The chi-square statistic is 5.9733. The *p*-value is .014524. The result is significant at $p < .05$.

Conclusion: In our study group of subjects with clinical evidence of ADEM has a good outcome. But children with ADEM need long-term follow up for cognitive impairments and emotional problems. Our studies has got certain limitations as the outcome could not be completely assessed in subjects within a short follow up of 2 month period. Previous studies varied with respect to follow-up periods and definitions of good or worst outcomes, which make comparison difficult. Children who made a full recovery did so within 6 to 12 months in cases of viral encephalitis, which suggests that all children with encephalitis should be monitored for 1 year after the acute illness.

Keywords: febrile, encephalopathy, children & etiology.
Study Design: Observational Study.

1. Introduction

Acute disseminated encephalomyelitis (ADEM) is a monophasic, postinfectious or postvaccineal acute inflammatory demyelinating disorder of central nervous system (CNS). The pathophysiology involves transient autoimmune response directed at myelin or other self-antigens, possibly by molecular mimicry or by nonspecific activation of autoreactive T-cell clones. Histologically, ADEM is characterized by perivenous demyelination and infiltration of vessel wall and perivascular spaces by lymphocytes, plasma cells, and monocytes.

The annual incidence of ADEM is reported to be 0.4-0.8 per 100,000 and the disease more commonly affects children and young adults, probably related to the high frequency of

ISSN: 0975-3583, 0976-2833 VOL11, ISSUE2, 2020

exanthematous and other infections and vaccination in this age group. There seems to be no gender predominance.

Earlier studies reported a mortality rate of 20% with a high incidence of neurologic sequela in those who survived probably it was related to high incidence of post measles ADEM. However, recent studies suggest a favorable prognosis Prolonged altered mental state was associated with both mortality and morbidity. Multiple or single extensive lesions on MRI lesions may be associated with disability. The long-term prognosis of this entity depends on the etiology, with post measles patients having a higher mortality rate and significant morbidity in survivors. The prognosis of nonmeasles cases is favorable and most studies report a full recovery in 50%-75% of patients, in a period of 1-6 months after the illness The most common sequela are focal motor deficits, could range from mild ataxia to hemiparesis.

2. Material and Methods

Present study was conducted at Amaltas Institute of Medical sciences, Dewas from June 2019 to July 2020 on 21 patients. Acute febrile encephalopathy (AFE) is a clinical term used to an altered mental state that either accompanies or follows a short febrile illness and is characterized by a diffuse and nonspecific brain insult manifested by a combination of coma, seizures, and decerebration.

A diagnosis of acute febrile encephalopathy is based on the following criteria:

1. Fever less than two week
2. Acute depression of consciousness or mental deterioration for more than 12 hours with or without motor or sensory deficit.
3. Total duration of illness at the time of admission two week or less.

Inclusion criteria: Children of age group two month to 12 years with acute onset of fever and symptoms with a duration of <14 days before coming to the hospital and >1 of the following signs (change in mental status including confusion, disorientation, coma, or inability to talk; new onset of seizures (excluding simple febrile seizures) were recruited into the study.

Exclusion criteria patients with features of febrile seizures, developmental delay, past history of encephalopathy, chronic disorders, reys syndrome, and non-infectious encephalopathy were excluded.

3. Result

Table 1: Age and Sex distribution in study group

AGE GROUP	MALE	FEMALE	TOTAL
2m-12 months	-	02	02 (10%)
1-5 Y	06	05	11 (52%)
> 5 Y	05	03	08 (38%)
Total	11	10	21

The chi-square statistic is 0.5305. The *p*-value is .046394. The result is significant at $p < .05$.

Table 2: Clinical Profile of the Cases of Viral Encephalitis

CLINICAL FEATURES	NUMBER OF CASES	PERCENTAGE
Fever	21	100
Headache	09	43
Convulsions	21	100

ISSN: 0975-3583, 0976-2833 VOL11, ISSUE2, 2020

GTCS	19	90
Focal seizures	02	10
Status epilepticus	08	38
Refractory seizures	04	19
GCS< 8	12	57
Hypertensic crisis	01	05
Ataxia	01	05
Tremors	01	05
Shock	03	14
Abnormal oculocephalic reflex	02	10
Cranial nerve palsy	02	10
Need of ventilator support	02	10
Prolonged coma more than 72 hours	05	24

TABLE 3: Definite/probable Diagnosis of Viral Encephalitis

ETIOLOGY	**NUMBER OF CASES**	**PERCENTAGE**
Entero virus encephalitis	04	19
HSV encephalitis	02	09
Rabies encephalitis	01	05
AIFLE	01	05
VE of undetermined etiology	13	62
Total	21	100

The chi-square statistic is 5.9733. The *p*-value is .014524. The result is significant at $p < .05$.

TABLE 4: Neurological Sequela on discharge in viral encephalitis

NEUROLOGICAL SEQUELE ON DISCHARGE	**No.**	**PERCENTAGE**
MAJOR SEQUELE		
A. Seizures	02	10
B. Motor deficits	06	29
C. Cranial nerve palsy		
D. Cognitive dysfunction	03	14
E. Aphasia		
MINOR SEQUELE		
A. Subtle neurological deficits		
B. Behavioral changes	08	38
COMPLETE RECOVERY	09	42
Number of patients		

ISSN: 0975-3583, 0976-2833 VOL11, ISSUE2, 2020

4. Discussion

Fever with altered mental state is a common symptom complex leading to hospital admissions in children in our country. This study was an observational prospective analysis of clinical, etiological and outcome of children presented with features of AFE of age group 02 months to 12 year. In this study total 60 cases were included and analyzed. We found that among this cases viral encephalitis was the most common etiology n=21(35%) followed by cerebral malaria n=16 (27%), pyogenic meningitis n=15 (25%), aseptic meningitis n=6 (10), ADEM N=2 (3%). In previous study of children with AFE in India also shows viral encephalitis was the most common etiology. (1, 2) Different studies from several regions of India have documented that pyogenic meningitis as the most common diagnosis in such children. A study by Kumar et al. (86) in children with acute encephalopathy showed pyogenic meningitis and JE to be responsible for 18% and 12% of cases, respectively. Mehrotra et al Found pyogenic meningitis in 49.1% and viral causes in 11.4%. (87%) In comparison to these studies, viral encephalitis was more common in the present study. This could be due to the fact that most patients in our hospital were referred from other places. This raises the possibility of enrolling more patients who did not respond to the usual treatment thus increasing the proportion of cases of viral encephalitis. Proper vaccination with HIB and pneumococcal vaccines may also have reduced the incidence of pyogenic meningitis.

Major sequela of post encephalitic epilepsy was noted in 02 (10%) and both were girls. This was comparable with previous studies reporting 10% and fivefold increase in post encephalitic epilepsy in girls (98).

5. Conclusion

In our study group of subjects with clinical evidence of ADEM has a good outcome. But children with ADEM need long-term follow up for cognitive impairments and emotional problems. Our studies has got certain limitations as the outcome could not be completely assessed in subjects within a short follow up of 2 month period. Previous studies varied with respect to follow-up periods and definitions of good or worst outcomes, which make comparison difficult. Children who made a full recovery did so within 6 to 12 months in cases of viral encephalitis, which suggests that all children with encephalitis should be monitored for 1 year after the acute illness.

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