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Original Article

Outcome of encephalitis in pediatric intensive care unit

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ABSTRACT:

Background: Encephalitis is a serious acute infection/parainfection of the brain which is often associated with significant mortality and morbidity. The present study was conducted to evaluate outcome of encephalitis in pediatric intensive care unit. **Materials &Methods:** 75 children age ranged 6-14 years of either gender with diagnosis of acute encephalitis admitted to pediatric intensive care unit were studied. **Results*:*** Age group 6-8 years had 28, 9-11 years had 32 and 12-14 years had 15 children. The difference was non- significant (P> 0.05). There were 35 non- survivors and 40 survivors. Mechanical ventilation was required in 30 and 23 and PICU stay was 22 days and 8 days in non- survivors and survivors respectively Causative agent found to be CMV in 5 and 7, Cosackie B1 in 6 and 11, Influenza & parainfluenza in 7 and 4, Adenovirus in 4 and 3, Enterovirus in 9 and 11, Herpesvirus in 5 and 4 in non- survivors and survivors respectively. Management done was inotropes in 28 and 21, anticonvulsant in 15 and 12, corticosteroid in 30 and 32 and IVIG in 14 and 8 respectively. The difference was significant (P< 0.05). **Conclusion:** Most of non- survivors required mechanical ventilation. A significant mortality was seen in pediatric encephalitis cases.

Key words: Children, Encephalitis, Intensive care unit

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INTRODUCTION

Encephalitis is a serious acute infection/parainfection of the brain which is often associated with significant mortality and morbidity. Manifestations include fever, headache, altered/fluctuating mental state (confusion/drowsiness) and seizures.[1] Enteric, respiratory, herpes viruses and various endemic micro-organisms are the culprits. Even with extensive investigations, however, a viral or infectious etiology may not be identified.[2]

Raised intracranial pressure (ICP), status epilepticus (SE), aspiration pneumonia, and/or autonomic instability are secondary causes of death in encephalitis patients.[3] Death may result from haemorrhage and refractory hypotension compounded by heart dysfunction in cases of dengue, chikungunya, malaria, leptospirosis, and rickettsial illnesses. Acute flaccid weakness that might lead to respiratory failure may be observed in dengue, JE, and West Nile encephalitis patients.[4] Since infectious encephalitis typically has one phase, many patients who get intensive care and mechanical ventilation (MV) as needed survive with varying degrees of success.[5]

Clinicians assessing patients with suspected encephalitis can use a recent consensus statement from the International Encephalitis Consortium as a useful tool.[6] Many encephalitis patients who are treated in a paediatric intensive care unit (PICU) pass away or suffer permanent brain damage.[7] The present study was conducted to evaluate outcome of encephalitis in pediatric intensive care unit.

MATERIALS &METHODS

The present study consisted of 75 children age ranged 6-14 years of acute encephalitis admitted to Pediatric intensive care unit of either gender. Parental consent with written permission was obtained.

Data such as name, age, gender etc. was recorded. Etiological agent, management, need of mechanical ventilation, PICU stay (days) was recorded. Etiologic agents were detected with conventional diagnostic methods using antigen detection by immunofluorescence test, nucleic acid detection by PCR and isolation of organisms from cerebrospinal fluids. Results of the study was subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Age group (Years)	Number	P value
6-8	28	0.67
9-11	32	

12-14	15	

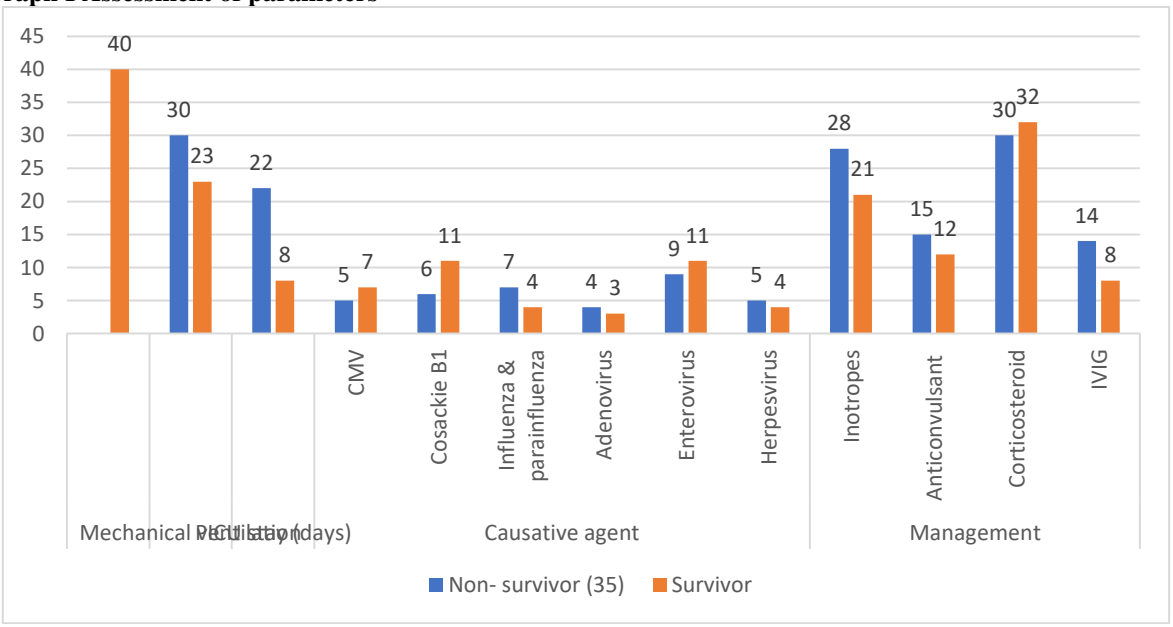
Table I shows that age group 6-8 years had 28, 9-11 years had 32 and 12-14 years had 15 children. The difference was non- significant (P> 0.05).

Table II Assessment of parameters

Parameters	Variables	Non- survivor (35)	Survivor (40)	P value
Mechanical ventilation		30	23	0.03
PICU stay (days)		22	8	0.01
Causative agent	CMV	5	7	0.05
	Cosackie B1	6	11	
	Influenza &parainfluenza	7	4	
	Adenovirus	4	3	
	Enterovirus	9	11	
	Herpesvirus	5	4	
Management	Inotropes	28	21	0.72
	Anticonvulsant	15	12	
	Corticosteroid	30	32	
	IVIG	14	8	

Table II, graph I shows that there were 35 non- survivors and 40 survivors. Mechanical ventilation was required in 30 and 23 and PICU stay was 22 days and 8 days in non- survivors and survivors respectively Causative agent found to be CMV in 5 and 7, Cosackie B1 in 6 and 11, Influenza & parainfluenza in 7 and 4,Adenovirus in 4 and 3, Enterovirus in 9 and 11, Herpesvirus in 5 and 4 in non- survivors and survivors respectively. Management done was inotropes in 28 and 21, anticonvulsant in 15 and 12, corticosteroid in 30 and 32 and IVIG in 14 and 8 respectively. The difference was significant (P< 0.05).

Graph I Assessment of parameters



DISCUSSION

Encephalitis is challenging to manage given the diversity of clinical and epidemiologic features.[8,9] More than 100 infectious species have been identified as causative agents of meningoencephalitis, with a burgeoning of new infectious and autoimmune etiologies in the last decade.[10] Despite advances in diagnosis, more than 50% of encephalitis cases remain cryptogenic, posing additional management challenges.[11,12] The present study was conducted to evaluate outcome of encephalitis in pediatric intensive care unit.

We found that age group 6-8 years had 28, 9-11 years had 32 and 12-14 years had 15 children. Patients with all-cause encephalitis getting care in the intensive care unit were the focus of Thakur et al's[13] investigation on predictors of outcome. When patients survived to be discharged from the hospital, they looked at mortality and predictors of outcomes. Out of 103 patients, the median age was 52 years. 52 patients (50.49%) were male, 28 (27.18%) of patients had viral encephalitis, 19 (18.45%) of patients developed status epilepticus (SE), 15 (14.56%) of patients had cerebral edoema, and 19 (18.45%) of patients died. It was found that

cerebral edoema, SE, and thrombocytopenia were all linked to death. Death was strongly linked (95%) with the need for endotracheal intubation with ventilator assistance. Also viral, nonviral, and unidentified causes of encephalitis were less likely to result in poor outcomes in patients who survived.

We observed that there were 35 non- survivors and 40 survivors. Mechanical ventilation was required in 30 and 23 and PICU stay was 22 days and 8 days in non-survivors and survivors respectively Causative agent found to be CMV in 5 and 7, Cosackie B1 in 6 and 11, Influenza & parainfluenza in 7 and 4, Adenovirus in 4 and 3, Enterovirus in 9 and 11, Herpesvirus in 5 and 4 in non- survivors and survivors respectively. Management done was inotropes in 28 and 21, anticonvulsant in 15 and 12, corticosteroid in 30 and 32 and IVIG in 14 and 8 respectively. Sifat et al[14] assessed the outcomes of children with convulsive status epilepticus and assessed the differences between two groups of children with new-onset seizures and known seizure disorders.Among 139 children with status epilepticus, 69.7% had a known seizure disorder. Focal seizures were present in 23.9% of children, and 34.6% required intubation; there was an overall mortality rate of 1.2%. However, an abnormal EEG was more common among children with known seizure disorders.

Sahin et al[15]reviewed age, previous seizure history, neurologic impairment, aetiology, outcome (including mortality or return to baseline), and initial EEG results in 22 individuals with RSE were hospitalised to the intensive care unit, ranging in age from 4.5 months to 18 years. All were given high-dose suppressive therapy for about 146 days, either alone or in combination, using pentobarbital, midazolam, propofol infusion, or high-dose phenobarbital. Seven out of the whole population of 22 died. EEG results, age, and aetiology all had an impact on mortality. The remote symptomatic group did not experience any deaths, and three of four children under the age of three perished, compared to four of 18 people above the age of three. Patients with focused EEG abnormalities had a lower death rate than those with generalised abnormalities.

CONCLUSION

Most of non- survivors required mechanical ventilation. A significant mortality was seen in pediatric encephalitis cases.

REFERENCES

1. Holtkamp M, Othman J, Buchheim K, et al. Predictors and prognosis of refractory status epilepticus treated in a neurological intensive care unit. J Neurol Neurosurg Psychiatry 2005;76:534–53.
2. Glaser CA, Gilliam S, Schnurr D, et al. In search of encephalitis etiologies: diagnostic challenges in the California Encephalitis Project, 1998–2000. Clin Infect Dis 2003;36:731–742.
3. Whitley RJ, Lakeman F. Herpes simplex virus infections of the central nervous system: therapeutic and diagnostic considerations. Clin Infect Dis 1995;20:414–420.
4. Granerod J, Tam CC, Crowcroft NS, Davies NW, Borchert M, Thomas SL. Challenge of the unknown: a systematic review of acute encephalitis in non-outbreak situations. Neurology 2010;75:924–932.
5. Steiner I, Budka H, Chaudhuri A, et al. Viral meningoencephalitis: a review of diagnostic methods and guidelines for management. Eur J Neurol 2010;17:999–57.
6. Tunkel AR, Glaser CA, Bloch KC, et al. The management of encephalitis: clinical practice guidelines by the Infectious Diseases Society of America. Clin Infect Dis 2008;47:303–3.
7. Glaser CA, Honarmand S, Anderson LJ, et al. Beyond viruses: clinical profiles and etiologies associated with encephalitis. Clin Infect Dis. 2006;43:1565–77.
8. Campbell GL, Hills SL, Fischer M, et al. Estimated global incidence of Japanese encephalitis: a systematic review. Bull World Health Organ. 2011;89:766–774.
9. Jmor F, Emsley HC, Fischer M, Solomon T, Lewthwaite P. The incidence of acute encephalitis syndrome in Western industrialised and tropical countries. Virol J. 2008;5:134.
10. Domingues RB, Teixeira AL. Management of acute viral encephalitis in Brazil. Braz J Infect Dis. 2009;13:433–9.
11. Sasaki J, Chegondi M, Raszynski A, Totapally BR. Outcome of children with acute encephalitis and refractory status epilepticus. J Child Neurol. 2014;29:1638–44.
12. Cai XY, Lu XD, Lin GY, et al. Monitoring of viral pathogens in pediatric intensive care unit and analysis of clinical significance. Zhonghua Er Ke Za Zhi. 2013;51:453–9.
13. Thakur KT, Motta M, Asemota AO, Kirsch HL, Benavides DR, Schneider EB, McArthur JC, Geocadin RG, Venkatesan A. Predictors of outcome in acute encephalitis. Neurology. 2013 Aug 27;81(9):793-800.
14. Sifat B. Outcome of children with convulsive status epilepticus admitted to a Pediatric intensive care unit. JAMDSR. 2012;16:11:412-14.
15. Sahin M, Menache CC, Holmes GL, Riviello Jr JJ. Outcome of severe refractory status epilepticus in children. Epilepsia. 2001 Nov 10;42(11):1461-7.