Original Research Paper

Volume - 7 | Issue - 6 | June - 2017 | ISSN - 2249-555X | IF : 4.894 | IC Value : 79.96

Pediatrics

A Study on Clinical Profile of Children with Acute Febrile Encephalopathy in a Tertiary Care Centre in Eastern Bihar.

Dr. Satish Kumar Assistant professor, Department of Pediatrics, Jawaharlal Nehru Medical College and Hospital, Bhagalpur.

Dr. Brajesh Kumar Senior Resident, Department of Pediatrics, Jawaharlal Nehru Medical College and Hospital, Bhagalpur.

ABSTRACT

Objective: To investigate the clinical and etiological profile of acute febrile encephalopathy in children presenting to a tertiary care center of Eastern Bihar.

Methods: 214 children (aged 1 month to 14 years) presenting to the Emergency, Pediatrics Department, Jawaharlal Nehru Medical College and Hospital, Bhagalpur with fever (> 38 degree Centigrade) of less than 2 weeks duration with altered sensorium with/ or without seizure were prospectively investigated for etiological cause. The investigations included blood and CSF counts, blood and CSF cultures, peripheral smear and serology for malarial parasite, and serology for Japanese encephalitis (JE) virus. Other investigations included EEG and CT or MRI wherever indicated.

Results: The most common presenting complaints apart from fever and altered sensorium were headache and vomiting. Convulsions, neck rigidity, hypertonia, brisk deep tendon reflexes, extensor plantar response and focal neurological deficits were seen in 50%, 57%, 22.4%, 28%, 39.3% and 9.3% of the subjects, respectively. The diagnoses based on clinical presentation and laboratory findings were pyogenic meningitis in 90 (42%), non JE viral encephalitis in 52 (25%), JE in 38 (18%), cerebral malaria in 16 (7%), herpes encephalitis and tubercular meningitis in 8 (4%) each, and typhoid encephalopathy in 2 cases.

Conclusion: Pyogenic meningitis and viral encephalitis including JE are the most common causes of acute presentation with fever and encephalopathy in Eastern Bihar. Preventive strategies towards this disease must be directed by the Health Department, so that this deadly disease and its sequalae can be prevented.

KEYWORDS : Viral encephalitis; Encephalopathy; Japanese encephalitis.

INTRODUCTION

Acute encephalopathy refers to a state of rapid deterioration of brain function, usually presenting as an alteration in state of consciousness, with or without focal neurological signs.[1]. Acute febrile encephalopathy is a common and severe neurological syndrome that is associated with significant morbidity and mortality in children. The etiologies differ according to geographical regions. Appropriate and efficient protocols for investigations and management requires proper understanding of various potential etiologies. Acute encephalopathy denotes a diffuse and nonspecific brain insult manifested by a combination of coma, seizures and decerebration, and is an important cause of morbidity and mortality in young hospitalized children. Various causes such as viral encephalitis, cerebral malaria, bacterial meningitis, Reye's syndrome etc. have been implicated in etiology and the proportionate contribution of each varies according to the geographical area. Despite so many epidemiological reports and investigations, the presentation with acute onset fever and altered sensorium has often remained a mystery especially in Bihar, Uttar Pradesh and West Bengal.[2-4] There has not been any comprehensive, systemic study of the etiology of childhood febrile encephalopathy in Bhagalpur, Bihar. The present study was conducted to Pediatrics Department, Jawaharlal Nehru Medical College and Hospital, Bhagalpur to find out the etiological pattern and clinical presentation of acute febrile encephalopathy in children.

MATERIAL AND METHODS

In the present study, all children (aged between 1 month and 14 years) presenting to the Department of Pediatrics, Jawaharlal Nehru Medical College and Hospital with fever (temperature > 38 degree centigrade) of less than 2 weeks duration along with altered sensorium with or without seizures were prospectively enrolled in the study from March 2015 to February 2017. Children having history of head injury, febrile seizures or past history of seizures were excluded from the study. A detailed history and clinical examination including neurological examination were done in all subjects. The investigations performed in every child included blood counts, peripheral smear for malarial parasite, quantitative buffy coat (QBC) for malaria, optimal test, blood culture, cerebrospinal fluid (CSF) examination for cytology, Gram stain, AFB stain, biochemistry and culture.

Samples for JE serology were collected aseptically, placed in labelled container in a CO2 jar, and were dispatched at the earliest possible opportunity to the laboratory. Anti-JE IgM was done by using the IgM antibody capture ELISA (MAC ELISA) in serum and CSF samples of the patients. Chest X-ray, Ultrasonography of the head, electroencephalogram and CT scan were done as and when required. Patients were diagnosed as confirmed cases of Japanese encephalitis if anti JE IgM was found to be positive in cerebrospinal fluid. Pyogenic meningitis was diagnosed on the basis of polymorphonuclear leucocytosis in CSF or/and positive Gram stain or culture of CSF. Cerebral malaria was diagnosed in patients having febrile encephalopathy along with positive peripheral smear or serology for Plasmodium falciparum.

RESULTS

Two hundred and thirty four children were admitted with a diagnosis of acute febrile encephalopathy during the study period. 20 children could not be included in the study as they left against medical advice after admission before the detailed work up could be completed. Two third of the cases were more than 5 years of age whereas the rest one-third were below the age of 5 year. Only 18 (8.4%) cases of acute febrile encephalopathy occurred in infants. Almost two-thirds (138 out of 2114; 64.5%) of the subjects were male. Majority (78.5%) of the cases belonged to Kahalgaon and Ekchari. The most common presenting complaints apart from fever and altered sensorium were headache and vomiting. In one-third (35.5%) of the cases, the duration of the fever was less than 72 hr. The duration of central nervous system (CNS) features was even shorter with headache and altered sensorium being present for less than 72 hours in 81.3% and 96.3% children, respectively. The mean (+ SD) Glasgow coma score (GCS) was 9.6 (+ 3.2). Convulsions were reported in 108 (50%) subjects. Neck stiffness and Kernig's sign were present in 122 (57%) and 94 (43.9%) cases, respectively. Hypertonia was present in 48 (22.4%) patients whereas brisk reflexes and extensor plantar response were present in 60 (28%) and 84 (39.3%) subjects, respectively. Focal neurological deficits at presentation were present in only 20 (9.3%) children. Leucocytosis (TLC > 14,000) was seen in 48.6% children.

The most common illness presenting as fever with altered sensorium was viral encephalitis seen in 98 (45.8%) cases. The cause of viral encephalitis was established as Japanese encephalitis in 38 (17.7%) patients and herpetic encephalitis in 8 (3.7%) patients. Pyogenic meningitis was second most common diagnosis responsible for 90 (42%) cases. Cerebral malaria was documented in 16 (7.5%) children and tubercular meningitis in 8 (3.7%) children presenting as acute febrile encephalopathy. Typhoid fever was a cause of encephalopathy

in one subject. Blood culture was positive only in 20 (22.2%) cases of pyogenic meningitis and CSF culture positivity was even less (14 out of 90; 15.5%). Among 38 cases of JE, 30 were older than 5 years. Only 2 cases of JE occurred in infancy. The duration of the symptoms of fever, headache and altered sensorium in these cases were comparable to the non-JE cases. Similarly, the proportion of cases having convulsions (52.6% vs. 50%), hypertonia (36.8 % vs. 19.3%), extensor plantar response (36.8% vs. 39.8%) and focal neurological deficits (10.5% vs. 9.1%) in JE was comparable to the other cases of acute febrile encephalopathy. Neck rigidity, however, was more commonly seen in JE (84.2% vs. 51.1%; P< 0.01).

DISCUSSION

In our study, viral encephalitis was the most common cause (46%) of acute febrile encephalopathy. 40% of cases (38 out of 98) of viral encephalitis could be attributed to Japanese encephalitis. Overall, JE was responsible for 18% of cases of acute febrile encephalopathy in children from our region. Pyogenic meningitis was the second most common diagnosis after viral encephalitis in children presenting with febrile encephalopathy. Earlier studies from several regions of India have documented the pyogenic meningitis to be the most common diagnosis in such children. A study by Kumar et al. from Lucknow, India in children with acute encephalopathy showed pyogenic meningitis and JE to be responsible for 18% and 12% of cases, respectively.[5] Mehrotra et al. found pyogenic meningitis in 49.1% and viral causes in 11.4%.[6] 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. This pattern could also be related to the catchment area of our hospital i.e. Eastern Bihar, where periodic outbreaks of JE and other viral encephalitis are common.

In one-fourth of the cases included in our study, no specific etiology was found and these were labeled as viral encephalitis due to other viruses. It is possible that a more detailed diagnostic work up such as serology and antigen detection by PCR for other viruses could have picked more etiologies. Cerebral malaria was the diagnosis in only 116 (7.5%) children in the study. Thus, it was an uncommon cause of fever presenting with encephalopathy in the present study area. Kumar et al in their study on 740 children with acute encephalopathy also found cerebral malaria in only 4 (0.5%) cases. [5] A prospective study of Thai childrenidentified dengue virus in maximum number of cases, followed by Japanese encephalitis, herpes simplex, human herpes virus 6, mumps, enterovirus, varicellazoster virus and rabies.[7]

Empirical treatment with quinine is very frequently used in children when they present with fever and encephalopathy in malaria endemic areas. However, the present study and similar other studies from South-East Asia show that cerebral malaria is a relatively uncommon cause of acute febrile encephalopathy in children. The resistance to quinine and other antimalarial drugs is slowly increasing in these countries.[8,9] This could be related to the empirical use of this drug in conditions where it is not warranted.

Thus, quinine should be offered to children with acute febrile encephalopathy only if there is documentation of infection with P. falciparum. All efforts however must be made to diagnose cerebral malaria by examining peripheral smear repeatedly and also by using serological tests in cases where index of suspicion is high.[10] In the present study, Gram stain positivity was seen in almost two-thirds of patients with pyogenic meningitis whereas the blood and CSF culture positivity were relatively low. This could be due to antibiotic being given outside prior to admission in our hospital in many patients. Most clinical features of JE in the present study were similar to those seen with other causes of acute febrile encephalopathy. This suggests that serology should be done in all cases of acute febrile encephalopathy to make the diagnosis of JE as the clinical presentation alone is not specific for this diagnosis. The proportion of children having seizures and focal neurological deficits in the present study was lower in comparison to an earlier study from Kumar et al [11], India which seems to be related to more virulent mutant strains of viruses in the place of their study.

CONCLUSION

Finally depending upon the findings of our study it was concluded that viral encephalitis was the most common cause of acute febrile encephalopathy in children from this region followed closely by pyogenic meningitis. Amongst children having viral encephalitis, JE was responsible for 2 out of 10 cases. Cerebral malaria was relatively uncommon cause of acute febrile encephalopathy. Limitations of our study is that being a hospital based study, done in a tertiary care center; the incidence observed in this study may not reflect the actual incidence of acute febrile encephalopathy of the entire population. The causes and risk factors for high prevalence of viral encephalitis need to be urgently explored in order to initiate preventive strategies. Vaccination against JE has already been started in this part of Bihar based on preliminary findings from the present study. Other studies need to be conducted in different geographical areas to find out usefulness of such a program. Preventive strategies towards this disease must be directed by the Health Department, so that this deadly disease and its sequalae can be prevented.

REFERENCES

1. Ginsberg L, Compston DAS. Acute encephalopathy: diagnosisand outcome in patients at a regional neurological unit. Q JMed 1994; 87 : 169-180.
2. John TJ. Outbreaks of Killer Brain Disease in Children: Mystery or Missed Diagnosis? Indian Pediatr 2003; 40: 863- 869.
3. Rathi AK, Kushwaha KP, Singh YD et al. JE virus encephalitis: 1988 epidemic at Gorakhpur. Indian Pediatr 1993; 30: 325-333.
4. Vashishtha VM, Nayak NC, John TJ, Kumar A. Recurrent annual outbreaks of a hepato-myo-encephalopathy syndrome in children in western Uttar Pradesh, India. Indian J Med Res 2007; 125: 523-533.
5. Kumar R, Mathur A, Kumar A, Sethi GD, Sharma S, Chaturvedi UC. Virological investigations of acute encephalopathy in India. Arch Dis Child 1990; 65: 1227-1230.
6. Mehrotra RM, Mathur AK, Khan AM, Chaturvedi UC, Kapoor AK. Acute encephalopathy: a clinicopathological study. Indian J Med Res 1971; 59: 705-714.
7. Chokephaibulkit K, Kankirawatana P, Apintanapong S,Pongthapisit V, Yoksan S. Viral etiologies of encephalitis inThai children. Pediatr Infect Dis J 2001; 20 : 216-218
8. DGHS. National Vector Borne Disease Control Programme, Directorate General of Health Services. New Delhi: Malaria Drug Resistance 2004, New Delhi: Ministry of Health and Family Welfare, 2004.
9. Directorate of National Vector Borne Disease Control Programme. Report of Meeting of an Expert Group, New Delhi: NVBDCP, 2004.
10. Kundu R, Ganguly N, Ghosh TK, Choudhury P, Shah RC. Diagnosis and management of malaria in children: Recommendations and IAP plan of action. Indian Pediatr 2005; 42: 1101-1114.
11. Kumar R, Tripathi P, Singh S, Bannerji G. Clinical features in children hospitalized during the 2005 epidemic of Japanese encephalitis in Uttar Pradesh, India. Clin Infect Dis 2006; 43:123-131.