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Clinical Profile and Outcome of Children Admitted with Acute Encephalitis Syndrome in a tertiary Care hospital in West Bengal, India

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Abstract: *Acute encephalitis syndrome (AES) is an important cause of mortality morbidity in children. We undertook the study for better understanding of clinical profile and outcome of AES in our settings . We retrospectively evaluated 24 patients of AES admitted in our institute from August to October 2015 by evaluating their outcomes using the Glasgow Outcome Scale (GOS). Among 24 cases AES patients, 6(25%) were recovered completely (GOSV) , while 11 (45.83%) cases had neurological sequelae (GOS II –IV) with a wide range of severity varying from mild to severe at the time of discharge.7(29.16%) patient died in the hospital (GOS I). Use of mechanical ventilation, lower Glasgow coma score, and concurrent seizures are predictors for a poor outcome.*

I. Introduction

Viral encephalitis is a globally distributed disease that seriously affects public health, threatening almost half of the world's population [1]. It may be sporadic like herpes simplex encephalitis (HSE), or epidemic such as Japanese B encephalitis (JE). The etiological agents are varied, and physicians treating such children often feel limited by the lack of availability of diagnostic testing for most of these agents. In developed countries, 50–60 % of survivors of viral encephalitis with clear etiologies had a poor prognosis after long-term follow-up [2– 6].

At present, pathogen detection for viral encephalitis is not widely used for clinical diagnosis and treatment in India; the diagnosis is largely based on clinical data and auxiliary examination of patients [7-8]. In addition, research shows that no more than 30–40 % of encephalitis cases can be pathogenically diagnosed, of which Japanese encephalitis (JE) is the most common cause in India[9-10,36] . And more than half of pathogenically diagnosed viral encephalitis have a poor prognosis[11] . On the other hand, 10–30 % of patients with clinically diagnosed viral encephalitis also have a poor prognosis. In India, nearly all states have reported JE cases except that of Jammu & Kashmir, Himachal Pradesh, and Uttaranchal [12]. The Northeastern region (NE region) of India, particularly the upper part of the state of Assam, has been experiencing recurrent episodes of JE with different magnitudes from July to October every year [13].Therefore we conducted retrospective study of the patients admitted for acute encephalitis syndrome during current season 1st August 2015 to 31st October 2015.This study is done for a better understanding and to determine the clinical profile and outcome of AES in hospitalized children and also to determine the incidence of J E in all cases of AES.

II. Matirial And Methods

Children with AES upto12 years of age who admitted in our pediatric ward of NRS Medical College & hospital (West Bengal, India) were included in this study during August to October 2015. This is a tertiary level hospital and provides health care services to four to five districts in west Bengal. Most patients are referred to this apex level institute from periphery because of lack of neuroimaging and intensive care facilities in the periphery.

For investigating AES cases, WHO case definition was adopted. Clinically a case of AES is defined as fever or recent history of fever with change in mental status (including confusion, disorientation, coma, or inability to talk) and/or new onset of seizures (excluding simple febrile seizures). Other early clinical findings could include an increase in irritability, somnolence or abnormal behavior greater than that seen with usual febrile illness [14-15]

Such Patients were excluded if they: (a) had other severe disease, such as severe infection other than in the central nervous system, malignancy, brain infarction or cerebral hemorrhage, malaria; (b) a diagnosis of delirium or encephalopathy secondary to sepsis, toxins, or metabolic causes.

The outcome of patients was graded with a functional outcome score (Glasgow Outcome Scale, GOS), as follows:

I death; II severe sequelae greatly impairing function and incompatible with independent living; III moderate sequelae mildly affecting function (including seizures), but compatible with independent living; IV minor sequelae including altered personality or clinical signs not affecting functions; V full recovery and normal neurologic examination findings [16], Prognostic analyses of the individual characteristics were calculated using a t test (for quantitative variables) or chi square test (for qualitative variables).

III. Results

This study examined 24 patients (14 boys; 56.5 %) with a mean onset age of 5.32 years (range 0.5-12 years).Out of 24 cases of AES, 6 patients (25%) were JE and 18 patients (75%) were non-JE. The JE cases were confirmed following detection of JEV specific IgM antibody either in CSF or serum. All the samples were found to be negative for the presence of IgM antibody against other flaviviruses, namely,Dengue prevalent in this region. Among the JE positive patients 2 were diagnosed by only serum testing positive for anti-JEV IgM antibodies and 1 was identified following detection of anti-JEV IgM antibodies in CSF only. In 3 AES patients both serum and CSF were positive for JEV specific IgM antibody. Among the JE positive cases 4 (66.6%) were male and 2 (33.3%) were female. The predominant age group affected was 4 to 12 years (Table 1) and the youngest child affected was 9 months old. Majority of the patients (85%) were from the rural area and belonged to low socioeconomic group (72%).Most of the children (83.3%) were not vaccinated against JE.

The demographic profile and clinical characteristics of the patients are shown in Table 1.

Basic blood investigations include a complete blood count (including platelet count), blood glucose, serum electrolytes, liver and kidney function tests, blood culture, arterial blood gas is done in all patients with AES . A peripheral smear for malarial parasite and rapid diagnostic test for malaria were also screened. CSF analysis done in all hemodynamically stable patients after excluding features of raised intracranial pressure. A neuroimaging study done prior to the CSF analysis where lumbar puncture was contraindicated.

Investigations are summarized in Table 2.

Among 24cases AES patients, 6(25%) were recovered completely (GOSV) , while 11 (45.83%) cases had neurological sequelae (GOS II –IV) with a wide range of severity varying from mild to severe at the time of discharge, 7(29.16%) patient died in the hospital (GOS I).

Clinical characteristics and investigations of patients with a poor or favorable outcome at discharge are compared in Tables 3.

Table 1Demographic profile and clinical characteristic (n=24)

Characteristic		Value
Age		5.32 yr (0.5-12)
Male		55%
GCS (on admission)	<8	11
	>8	13
Length of hospital stay		7.36 days (3-28)
Duration of fever on presentation		9.8 days (2-30)
Headache		43%
Unconsciousness		90%
Seizure		60%
Limb weakness		25%
Altered behavior		20%

Table 2Investigation results and value

Characteristic	Value (mean, median, SD)
CSF cell (/ c mm)	58.4,6,(137.6)
CSF protein (mg/dl)	76.08,54.5 (70.13)
CSF glucose(mg/dl)	74.2,29.5 (24.55)
Serum protein(gm/dl)	5.03, 5.8 (1.3)
SGOT (IU)	152, 69 (195)
SGPT (IU)	162, 38.5 (33)
Hemoglobin (Gm/dl)	11.34, 11 (1.8)
Platelet (lacs/cmm)	2.9, 2.5 (1.63)
Total leucocyte count (/cmm)	14800,11000 (955)

Serum sodium (meq/L)	137.38, 137 (5.5)
Serum potasium (meq/L)	4.28,4.45 (0.64)
Serum ionized calcium (mol/L)	0.84,0.85 (0.22)
Blood urea(mg/dl)	26.5,27 (14.9)
Serum creatinine(mg/dl)	0.76,0.75 (0.27)

Table 3Characteristic vs outcome

Character		Unfavourable outcome	favourable outcome	P value
Length of hospital stay (days)	<7	10	4	1
	>7	7	3	
Need for mechanical ventilation	Yes	15	3	0.038
	No	2	4	
GCS on admission	<8	15	2	0.0085
	>8	2	5	
Recurrent seizures	Yes	16	4	0.05
	no	1	3	
MRI abnormality	yes	16	4	0.05
	no	1	3	

IV. Discussion

This study retrospectively analyzed data of 24 patients diagnosed with AES in a tertiary care hospital largest hospital from 1st August to 31st October 2015 . The etiological agent of AES is varied. Viral agents that may be encountered in AES in an epidemic form include Japanese encephalitis, which is a major public health problem because of large endemic areas in the country, the high case fatality rate (20-30%) and frequent residual neuropsychiatric damage (50-70%) [17]; Enteroviruses, especially EV 71 [18], reported also from sporadic encephalitis cases [19]; Chandipura virus [20-21]; Nipah virus [22]; and, Chikangunya virus [23]. Another common viral agent of AES in the epidemic setting, being recognized more commonly now, is Dengue virus [24]. Viral agents responsible for sporadic encephalitis include Varicella zoster virus, Mumps, Human herpesvirus 6 and 7, Epstein Barr virus, and most importantly, Herpes simplex virus. Herpse simplex virus encephalitis (HSE) is the most common cause of sporadic fatal viral encephalitis, with an incidence of 1-3/million in western countries [25] . Not much information is available regarding proportion of AES cases due to HSE in the Indian setting.

The present study demonstrates that JE is one of the leading forms of viral encephalitis of children in this part of the Country becasuse around 25% of children with AES admitted in our institution were diagnosed as confirmed JE. Similar study carried out in Cuddalore district, Tamil Nadu also reported 29.3% patients with JE in hospitalized AES children [26]. In our study, children mostly affected were from rural areas (85%) and belong to low socioeconomic group (72%). This correlated well with the earlier studies where the patients were children of farmers or farm laborers of low socioeconomic group residing in rural areas [27-28]. This may be due to favorable epidemiological factors like presence of water logged paddy field supporting profuse breeding of vector mosquitoes, piggeries in close proximity to residence, nonuse of bed nets and outdoor playing habits of children. JE incidences have been declining sharply in pediatric age group in Taiwan after the vaccination programme began in 1967 [29]. This emphasizes the need of quality coverage of JE mass vaccination program and consequently vaccination campaign should be evaluated for appropriate corrective measures [30]. Moreover, continuation of JE vaccination of children in routine immunization in these JE endemic districts of West bengal should be a public health priority.

Among the clinical presentation, fever, altered sensorium, seizures and headache were the most common symptoms observed in this study. In children similar manifestation was also noted in earlier studies [31].

In our study, the use of mechanical ventilation, a GCS score below 8, and concurrent seizures were found to be poor prognostic factors of encephalitis. These risk factors have also been identified in various studies. One retrospective study by Ooi et al. [32], concludes that low perfusion, GCS score below 8, and convulsions were associated with poor prognosis. Another retrospective study done at French over 253 encephalitis cases found similar results. [34]. Use of mechanical ventilation, lower Glasgow coma score (GCS) and concurrent seizures are good predictors of poor outcome in acute encephalitis syndrome .So we should manage the patient aggressively when these poor prognostic factors present without wasting golden hours irrespective of etiology . Children with Glasgow Coma Score less than 8 should preferably be intubated; mechanical ventilation should be provided in case the breathing efforts are not adequate.

In our study, 45.83% AES patients had neurological sequelae at the time of discharge, while 29.16% had died in hospital. Mortality was associated with GCS within 3 to 8. Neurological sequelae in AES are the common observation [34]. Our study corroborates with the findings A Fowler et al study which indicates sequele at discharge in 60% of the patients.[35]

V. Conclusion

This study offers a description of the present etiology, clinical presentation and short-term outcome of AES. Need of mechanical ventilation, lower GCS score, and concurrent seizures are good predictors for a poor outcome in these patients. However, the large group of cases with unknown etiology and the lack of data on long-term outcome all indicate the need for further studies in this field. Reporting and appropriate workup of all cases would strengthen the AES surveillance and go a long way in reducing the morbidity and mortality due to this disorder.

References

[1]. Hinson VK, Tyor WR (2001) Update on viral encephalitis. J Curr Opin Neurol 14(3):369–374
[2]. McGrath N, Anderson NE, Croxson MC et al (1997) Herpes simplex encephalitis treated with acyclovir: diagnosis and long term outcome. J Neurol Neurosurg Psychiatry 63(3):321–326
[3]. Utley TFM, Ogden JA, Gibb A et al (1997) The long-term neuropsychological outcome of herpes simplex encephalitis in a series of unselected survivors. J Cognit Behav Neurol 10(3):180–189
[4]. Raschilas F, Wolff M, Delatour F et al (2002) Outcome of and prognostic factors for herpes simplex encephalitis in adult patients: results of a multicenter study. J Clin Infect Dis 35(3):254–260
[5]. Erlanger TE, Weiss S, Keiser J et al (2009) Past, present, and future of Japanese encephalitis. J Emerg Infect Dis 15(1):1
[6]. Solomon T (2006) Control of Japanese encephalitis-within ourgrasp? N Engl J Med 355(9):869
[7]. Solomon T, Hart IJ, Beeching NJ (2007) Viral encephalitis: a clinician's guide. J Pract Neurol 7(5):288–305
[8]. Stahl JP, Mailles A, Dacheux L et al (2011) Epidemiology of viral encephalitis in 2011. J Me´d et Mal Infect 41(9):453–464
[9]. Wang WS, Liu CP (2011) The clinical presentation, diagnosis, treatment, and outcome of encephalitis: five years of experienceat a medical center in Northern Taiwan. Int J Gerontol 5(1):9–12
[10]. Wang L, Hu W, Magalhaes RJS et al (2014) The role of environmental factors in the spatial distribution of Japaneseencephalitis in mainland China. Environment international 73:1–9
[11]. Jing Zhou, Xinyue Qin (2012) Clinical features and influencing factors of prognosis in patients with viral encephalitis (in Chinese).J Chin Gener Prac Chin 15(34):3975–3977
[12]. N. Arunachalam, R. Rajendran, P. P. Samual et al., "Studies on Japanese encephalitis in Kurnool district, Andhra Pradesh,"CRME Annual Report.
[13]. P. Dutta, S. A. Khan, A. M. Khan, J. Borah, C. K. Sarmah, and J. Mahanta, "The effect of Insecticide-Treated Mosquito Nets (ITMNs) on Japanese encephalitis virus seroconversion in pigs and humans," American Journal of Tropical Medicine and Hygiene, vol. 84, no. 3, pp. 466–472, 2011.
[14]. T. Solomon, T. T. Thao, P. Lewthwaite et al., "A cohort study to assess the new WHO Japanese encephalitis surveillance standards," Bulletin of the World Health Organization, vol. 86, no. 3,pp. 178–186, 2008.
[15]. A. Rayamajhi, R. Singh, R. Prasad, B. Khanal, and S. Singhi, "Study of Japanese encephalitis and other viral encephalitis in Nepali children," Pediatrics International, vol. 49,no. 6, pp. 978–984, 2007.
[16]. Jennett B, Bond M (1975) Assessment of outcome after severe brain damage: a practical scale. J Lancet 305(7905):480–484
[17]. World Health Oraganisation. Acute Encephalitis Syndrome. Japanese encephalitis surveillance standards. January 2006. From WHO-recommended standards for surveillance of selected vaccine-preventable diseases. WHO/V&B/03.01.Available from: http://www. who. int/vaccines-documents/DocsPDF06/843.pdf. Accessed on 8 August, 2012.
[18]. Sapkal GN, Bondre VP, Fulmali PV, Patil P, GopalkrishnaV, Dadhania V, et al. Enteroviruses in patients with acute encephalitis, Uttar Pradesh, India. Emerg Infect Dis.2009;15:295-8.
[19]. Karmarkar SA, Aneja S, Khare S, Saini A, Seth A, Chauhan BK. A study of acute febrile encephalopathy with special reference to viral etiology. Indian J Pediatr. 2008; 75:801-5.
[20]. Rao BL, Basu A, Wairagkar NS, Gore MM, Arankalle VA, Thakare JP, et al. A large outbreak of acute encephalitis with high fatality rate in children in Andhra Pradesh, India, in 2003, associated with Chandipura virus. Lancet.2004; 364:869-74.
[21]. Chadha MS, Arankalle VA, Jadi RS, Joshi MV, Thakare JP, Mahadev PV, et al. An outbreak of Chandipura virus encephalitis in the eastern districts of Gujarat state, India. Am J Trop Med Hyg.2005; 73:566-70.
[22]. Harit AK, Ichhpujani RL, Gupta S, Gill KS, Lal S, Ganguly NK, et al. Nipah/Hendra virus outbreak in Siliguri, West Bengal, India in 2001. Indian J Med Res. 2006; 123:553-60.
[23]. Kalantri SP, Joshi R, Riley LW. Chikungunya epidemic: an Indian perspective. Natl Med J India. 2006; 19:315-22.
[24]. Kumar R, Tripathi S, Tambe JJ, Arora V, Srivastava A, Nag VL. Dengue encephalopathy in children in Northern India: clinical features and comparison with non dengue. J Neurol Sci. 2008; 269:41-8.
[25]. Steiner I. Herpes simplex virus encephalitis: new infection or reactivation? Curr Opin Neurol. 2011; 24:268-74.
[26]. L. Kabilan, S. Ramesh, S. Srinivasan, V. Thenmozhi, S. Muthukumaravel,and R. Rajendran, "Hospital- and laboratory-based investigations of hospitalized children with central nervous system-related symptoms to assess Japanese encephalitis virus etiology in Cuddalore district, Tamil Nadu, India," Journal of Clinical Microbiology, vol. 42, no. 6, pp. 2813–2815, 2004.
[27]. R. Potula, S. Badrinath, and S. Srinivasan, "Japanese encephalitis in and around Pondicherry, south India: a clinical appraisal and prognostic indicators for the outcome," Journal of Tropical Pediatrics, vol. 49, no. 1, pp. 48–53, 2003.
[28]. R. Kumar, P. Tripathi, S. Singh, and G. Bannerji, "Clinical features in children hospitalized during the 2005 epidemic of Japanese encephalitis in Uttar Pradesh, India," Clinical Infectious Diseases, vol. 43, no. 2, pp. 123–131, 2006.
[29]. K.-M. Chen, H.-C. Tsai, C.-L. Sy et al., "Clinical manifestations of Japanese encephalitis in southern Taiwan," Journal of Microbiology, Immunology and Infection, vol. 42, no. 4, pp. 296–302, 2009.
[30]. "Fourth Biregional Meeting on the Control of Japanese Encephalitis (JE): Report of the Meeting Bangkok,Thailand, 7- 8 June 2009," Tech. Rep.,WHO, Regional Office for South-East Asia, 2010.
[31]. K. S. Avabratha, P. Sulochana, G. Nirmala, B. Vishwanath, M. Veerashankar, and K. Bhagyalakshmi, "Japanese encephalitis in children in Bellary Karnataka: clinical profile and Sequelae," International Journal of Biomedical Research, vol. 3, no. 02, pp. 100–105, 2012.
[32]. Ooi MH, Lewthwaite P, Lai BF et al (2008) The epidemiology, clinical features, and long-term prognosis of Japanese encephalitis in central Sarawak, Malaysia, 1997–2005. J Clin Infect Dis 47(4):458–468
[33]. Koskiniemi M, Rantalaiho T, Piiparinen H et al (2001) Infections of the central nervous system of suspected viral origin: a collaborative study from Finland. J J Neurovirol 7(5):400–408
[34]. Y. C. Wu, Y. S. Huang, L. J. Chien et al., "The epidemiology of Japanese encephalitis in Taiwan during 1996-1997," American Journal of Tropical Medicine and Hygiene, vol. 61, pp. 78–84,1999.

[35]. Fowler, T. Sto¨dberg, M. Eriksson, R. Wickstro¨m,_ Childhood encephalitis in Sweden: Etiology, clinical presentation and outcomeEuropean J ournal of Pediatric Neurology vol. 12 (2008) pp.484 – 490
[36]. Vashishtha VM, Ramachandran VG Indian. Vaccination Policy for Japanese Encephalitis in India: Tread with Caution. Pediatr. 2015 Oct 8;52(10):837-9