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Clinical Outcome of Children Admitted with Acute Encephalitis Syndrome in a Tertiary Care Hospital, Dhaka, Bangladesh

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Abstract **Original Research Article**

Background: Acute encephalitides are the most common cause of acute neurological disease in children. This is a potentially devastating neurological syndrome with different etiologies including direct central nervous system infection with different agents most commonly viral and those mediated by immune system. The management has changed dramatically in recent years for several reasons including improved diagnostic and brain imaging techniques, better antiviral and more advanced neurointensive care and rehabilitation. ***Objective*****:** To observe the presentation, diagnostic approach and management of the children admitted in neuroscience department of Dhaka Shishu Hospital. ***Method*****:** A retrospective analysis of suspected encephalitis was done from records of discharged patients of the Neurosciences Department at Dhaka Shishu Hospital from January 2011-February 2013. SPSS is used for statistical analysis. ***Result:*** This study examined 31 patients (17 boys; 56.5 %, 14 Girls;45.16) with a mean onset age of 5.32 years (range 0.5-12 years).Out of 31 cases of AES, 8 patients (25.81%) were JE and 24 patients (77.42%) were non-JE. Among 31cases AES patients, 8(25.81%) were recovered completely (GOSV) , while 14 (45.16%) cases had neurological sequelae (GOS II –IV) with a wide range of severity varying from mild to severe at the time of discharge, 9(29.03%) patient died in the hospital (GOS I). ***Conclusion:*** The majority of cases of encephalitis have no known etiology with HSV being the most commonly identified pathogen in developed countries. Despite treatment with acyclovir, morbidity remains high. Diagnostic criteria, laboratory facility, treatment guideline and long term follow up is essential.

Keywords: Outcome, Acute Encephalitis Syndrome, Neurointensive.

INTRODUCTION

Acute encephalitides are the most common cause of acute neurological disease in children. This is a potentially devastating neurological syndrome with different etiologies including direct central nervous system infection with different agents most commonly viral and those mediated by immune system. The management has changed dramatically in recent years for several reasons including improved diagnostic and brain imaging techniques, better antiviral and more advanced neurointensive care and rehabilitation. 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 [1–5]. 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 [6-7]. 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 [8-9,35]. And more than half of pathogenically diagnosed viral encephalitis have a poor prognosis [10]. 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 [11]. 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 [12].Therefore we conducted retrospective study of the patients admitted for acute encephalitis syndrome during current season 1st August 2015 to 31st October 2015. To observe the presentation, diagnostic approach and management of the children admitted in neuroscience department of Dhaka Shishu Hospital.

OBJECTIVES

General objective:

- To observe the presentation, diagnostic approach and management of the children admitted in neuroscience department of Dhaka Shishu Hospital.

METHODOLOGY AND MATERIALS

A retrospective analysis of suspected encephalitis was done from records of discharged patients of the Neurosciences Department at Dhaka Shishu Hospital from January 2011-February 2013. 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 [13-14].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 normalneurologic examination findings [15] Prognostic analyses of the individual characteristics were calculated using at test (for quantitative variables) or chi square test (for qualitative variables). SPSS is used for statistical analysis.

RESULTS

This study examined 31 patients (17 boys; 56.5 %, 14 Girls;45.16) with a mean onset age of 5.32 years (range 0.5-12 years).Out of 31 cases of AES, 8 patients (25.81%) were JE and 24 patients (77.42%) were non-JE. The JE cases were confirmed following detection of JEV specific IgM antibody either in CSF or serum. GCS (on admission) <8 days were 14(45.16%) and >8 days 17(54.84%), length of hospital stay 7.36 days (2-30), Headache 13(41.94%), unconsciousness 28(90.32%), seizure 19(61.29%), limb weakness 8(25.81%), Altered behavior 7(22.58%) in Table-1. Among 31cases AES patients, 8(25.81%) were recovered completely (GOSV) , while 14 (45.16%) cases had neurological sequelae (GOS II –IV) with a wide range of severity varying from mild to severe at the time of discharge, 9(29.03%) patient died in the hospital (GOS I) in fig-1. Clinical characteristics and investigations of patients with a poor or favorable outcome at discharge arecompared in Table-3 length of hospital stay (days) <7 Unfavorable outcome 13(41.94%), favorable outcome 5(16.94%) and length of hospital stay (days) >7 unfavorable outcome 9(29.03%), favorable outcome 4(12.90%), Need for mechanical ventilation unfavorable outcome 17(54.84%), favorable outcome 4(12.90%) and No need for mechanical ventilation unfavorable outcome 4(12.90%), favorable outcome 6(19.35%), GCS on admission (days) <8 unfavorable outcome 19(41.94%), favorable outcome 4(12.90%) and length of hospital stay (days) >8 unfavorable outcome 3(9.68%), favorable outcome 5(16.13%), Recurrent seizures in unfavorable outcome 20(64.52%), favorable outcome 6(19.35%) and no recurrent seizures in unfavorable outcome 2(6.45%), favorable outcome 3(9.68%), MRI abnormality in unfavorable outcome 19(41.94%), favorable outcome 2(6.45%)and no MRI abnormality in unfavorable outcome 2(6.45%), favorable outcome 5(16.13%).

Table-1: Demographic profile and clinical characteristic (n=31)

Characteristic		Value	
		N	%
Age		5.32years(0.5-12)	
Sex			
Boys		17	54.84
Girls		14	45.16
GCS(on ad)	<8	14	45.16
	>8	17	54.84
Length of hospital stay		7.36 days (3-28)	
Duration of fever on presentation		9.8days(2-30)	
Headache		13	41.94
Unconsciousness		28	90.32
Seizure		19	61.29
Limb weakness		8	25.81
Altered behavior		7	22.58

Table-2: Investigation results and value (N=31)

Characteristic	Value		
	Mean	median	SD
CSF cell (/ c mm)	58.4	6	137.6
CSF protein (mg/dl)	76.08	54..5	7013
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

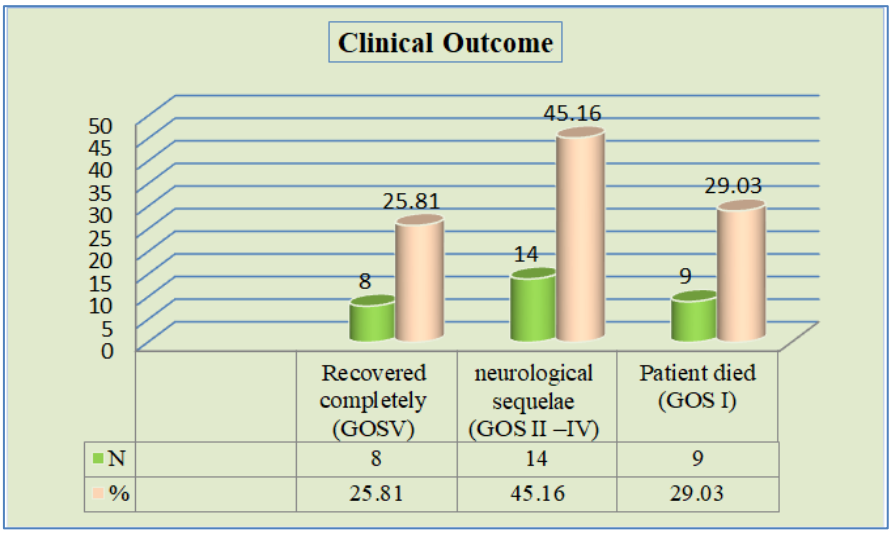

Fig-1: Clinical outcome of the Patients (N=31)

Table-3: Characteristic vs outcome (N=31)

Character	Value	Unfavourable outcome		favourable outcome		P value
		N	%	N	%	
Length of hospital stay(days)	<7	13	41.94	5	16.13	1
	>7	9	29.03	4	12.90	
Need for mechanical ventilation	yes	17	54.84	4	12.90	0.038
	no	4	12.90	6	19.35	
GCS on admission	<8	19	61.29	3	9.68	0.0085
	>8	4	12.90	5	16.13	
Recurrent seizures	yes	20	64.52	6	19.35	0.05
	no	2	6.45	3	9.68	
MRI abnormality	yes	19	61.29	5	16.13	0.05
	no	2	6.45	5	16.13	

DISCUSSION

This study retrospectively analyzed of suspected encephalitis was done from records of discharged patients of the Neurosciences Department at Dhaka Shishu Hospital from January 2011-February 2013. The etiological agent of AES is varied. Viral agents thatmay be encountered in AES in an epidemic form include Japanese encephalitis, which is a major public healthproblem because of large endemic areas in the country, the high case fatality rate (20-30%) and frequent residual neuropsychiatric damage (50-70%) [16] Enteroviruses, especially EV 71 [17], reported also from sporadic encephalitis cases [18] Chandipura virus [19-20] Nipah virus [21] and, Chikangunya virus [22]. Another common viral agent of AES in the epidemic setting, being recognized more commonly now, is Dengue virus [23]. 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 [24]. 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 [27]. 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 [26-27]. 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 [28]. This emphasizes the need of quality coverage of JE mass vaccination program and consequently vaccination campaign should be evaluated for appropriate corrective measures [29]. 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 [30]. 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, Among 31cases AES patients, 8(25.81%) were recovered completely (GOSV) , while 14 (45.16%) cases had neurological sequelae (GOS II – IV) with a wide range of severity varying from mild to severe at the time of discharge, 9(29.03%) patient died in the hospital (GOS I). 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].

Limitations of the Study

This was a single centered study with a small sized sample. So, the findings of this study may not reflect the exact scenario of the whole country.

CONCLUSION AND RECOMMENDATIONS

The majority of cases of encephalitis have no known etiology with HSV being the most commonly

identified pathogen in developed countries. Despite treatment with acyclovir, morbidity remains high. Diagnostic criteria, laboratory facility, treatment guideline and long term follow up is essential.

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