

A STUDY OF CLINICAL PROFILE OF ADULT PATIENTS WITH ACUTE ENCEPHALITIS SYNDROME COMING TO A TERTIARY CARE HOSPITAL OF NORTH EAST INDIA

Anupam Dutta¹, Mahanjit Konwar², Paul Pranab Kumar³

¹Assistant Professor, Department of Medicine, Assam Medical College & Hospital, Dibrugarh, Assam.

²Registrar, Department of Pharmacology, Assam Medical College & Hospital, Dibrugarh, Assam.

³Registrar, Department of Pharmacology, Assam Medical College & Hospital, Dibrugarh, Assam.

ABSTRACT

CONTEXT

Acute encephalitis syndrome (AES) is a public health problem in north east India with Japanese encephalitis being a major aetiology. Government of India initiated an adult JE vaccination in Assam in 2011.

AIMS

We aim to study the clinical profile and outcome in adult AES and JE patients after Government's JE vaccination.

SETTINGS AND DESIGN

Adult AES patients from 1st May 2014 to 31st October 2014 were included in this open label, observational, prospective study.

METHODS AND MATERIALS

Data was collected regarding clinical history and outcome. JE confirmation was done by CSF and sera samples screened to detect JEV- specific immunoglobulin M (IgM).

STATISTICAL ANALYSIS USED

Data analysis was done using GraphPad Prism software version 6.0.

RESULTS

141 (96 males, 45 females) patients of AES, were studied. With average hospital stay of 5.87 days, 100% had fever, 99.3% headache, 56.7% vomiting, 93.6% altered sensorium, 87.2% dizziness and 51.1% had seizure. 44% AES improved, 29.07% suffered residual neurological deficit and 26.65% expired. Out of 38 patients who died, 29(76.31%) patients had a GCS \leq 7. JE was detected in 26 patients, equivocal in 2 patients and negative in 113 patients. 14(53.84%) JE patients improved, 9(34.61%) suffered residual neurological deficit and 3(11.53%) expired. JE vaccination was present in 7(4.96%) patients.

CONCLUSIONS

JE positive cases have reduced in adults AES patients after Government vaccination program but vaccination coverage among the AES patients was low. Clinical presentation of adult AES patients differs from most reported paediatric AES cases. However, the mortality and morbidity of AES and JE still remains high, GCS < 7 being a bad prognostic marker.

KEYWORDS

Acute Encephalitis Syndrome (AES), Japanese Encephalitis (JE), Japanese Encephalitis Adult Vaccination.

KEY MESSAGES

JE positive cases have reduced in adults AES patients of North East India after Government vaccination (Live vaccine SA-14-14-2).¹ program for the first time in Assam in 2011; however, the mortality and morbidity of AES and JE still remains high.

HOW TO CITE THIS ARTICLE: Dutta A, Konwar M, Kumar PP. A study of clinical profile of adult patients with acute encephalitis syndrome coming to a tertiary care hospital of North East India. J. Evid. Based Med. Healthc. 2016; 3(46), 2299-2302. DOI: 10.18410/jebmh/2016/508

INTRODUCTION: Acute encephalitis syndrome (AES) is defined as acute onset of fever and a change in mental status with or without new onset of seizures.²

Financial or Other, Competing Interest: None.
Submission 12-05-2016, Peer Review 01-06-2016,
Acceptance 07-06-2016, Published 09-06-2016.

Corresponding Author:

Dr. Anupam Dutta,
Revati House, Purnananda Road,
Shantipara, Dibrugarh-786001, Assam.
E-mail: dranupamadutta@yahoo.com,
dranupamadutta80@gmail.com
DOI: 10.18410/jebmh/2016/508

AES has multifactorial aetiology with Japanese encephalitis (JE) and Dengue being the most common in South-East Asia and covering a population more than 3 billion. It has a high fatality rate involving one-third of infected patients and half of the survivors being affected with various neuropsychiatric sequelae. It remains a public health problem in various regions of India including the Brahmaputra valley of North East India. Although paediatric population are more susceptible to JE.

In recent studies, the number of JE cases was found to be more in adult population in Assam. Borah J et al³ provides some significant differences in clinical features of paediatric

and adult with JE. Patgiri S et al⁴ also found 66% of AES patients to be adults. Government of India initiated an adult JE vaccination (live vaccine SA-14-14-2) program for the first time in Assam in 2011.

AIMS AND OBJECTIVES: This study was undertaken for a better overview of the clinical profile and outcome in adult AES and JE patients coming to a tertiary care hospital of North East India, especially after Government's JE vaccination campaign in adults.

SUBJECTS AND METHODS:

MATERIALS AND METHOD: All patients coming to the department of Medicine, with AES for six months from 1st May 2014 to 31st October 2014 were included in this open label, observational, prospective study. Children below 12 years, pregnant women were excluded. A proper informed consent was taken and data was collected regarding age, sex, clinical history, diagnosis, duration of illness, laboratory parameters, vaccination status of JE, clinical features and outcome. The confirmation of JE was done by collecting CSF and sera samples from the patients which were screened to detect presence of JEV- specific immunoglobulin M (IgM) using JEV IgM capture ELISA kit (National Institute of Virology, Pune, India). Data analysis was done using GraphPad prism software version 6.0. Results.

RESULTS AND OBSERVATIONS: 141 patients were included in our study over a period of 6 months with most cases in the month of July (87) and August (30) as described in Table no 1. 96(68%) were males and 45(32%) were females. Overall mortality was seen in 38(26.95%). A history of JE vaccination was found in only 7(4.96%) of patients with AES. The average hospital stay by the patients was 5.87 days with a standard deviation of 3.237 and maximum stay was found to be 21 days. All admitted patients presented with fever associated with headache in 99.3% and vomiting in 56.7% as shown in Table no 2. Altered sensorium was present in 93.6%, dizziness in 87.2%, and seizure in 51.1% of patients at the time of admission. A few patients also reported with diarrhoea 10.15% along with other symptoms. Neck rigidity was present in 37.6% and focal neurological deficit in 29.1%. There was also a history of taking medications to alleviate fever and body ache in 46.80% of patients admitted from local doctors and pharmacist.

The average GCS at presentation was 6.29 with a standard deviation of 2.7. Analysing GCS score of the patients, it was found that 93(66%) patients had a score of less than equal to 7 and the rest 48(44%) patients had more than 7. Out of 38 patients who died, 29(76.31%) patients had a GCS \leq 7 and 9 patients (23.68%) had a GCS $>$ 7. After the treatment, 62(44%) patients with AES improved,

41(29.07%) suffered residual neurological deficit and 38(26.65%) expired.

Japanese Encephalitis was detected in 26 patients, equivocal in 2 patients and negative in 113 patients. 14(53.84%) patients with JE positive improved, 9(34.61%) suffered residual neurological deficit and 3(11.53%) expired. Past vaccination for Japanese encephalitis was present in 7 AES patients whereas none of the patients with JE had a reported history of such vaccination. The CSF showed an average protein 73.3+4.54, sugar 38.02+2.8 mg/dL, 24.64+2.45 cells 96.4+0.77 lymphocytes.

Parameters	No. of Patients (n=141)	Percentage (%)
Sex		
Males	96	68.08%
Females	45	31.92%
Age		
<20 years	19	13.5%
21-30 years	26	18.4%
31-40 years	29	20.6%
41-50 years	18	12.8%
51-60 years	23	16.3%
61-70 years	18	12.8%
>70 years	8	5.7%
Month Wise Distribution		
May	4	2.8%
June	5	3.5%
July	87	61.7%
August	30	21.3%
September	9	6.4%
October	6	4.3%
Outcome		
Improved	62	43.97%
Suffered Residual Neurological Deficit	41	29.08%
Expired	38	26.65%
Vaccination		
JE Vaccination History	7	4.96%
Japanese Encephalitis		
JE Positive	26	18.44%
JE Equivocal	2	1.42%
JE Negative	113	80.14%
JE Positive Improved	14	53.84%
JE Positive Residual Neurological Deficit	9	34.61%
JE Positive Expired	3	11.53%

Table 1: Demographic Profile

Clinical Features	No. of. AES Patients (n=141)	Percentage (%)	No. of. JE positive Patients (n=26)	Percentage (%)
Fever	141	100	26	100
Head Ache	140	99.3	26	100
Vomiting	80	57.7	19	73
Altered Sensorium	132	93.6	24	92.3
Dizziness	123	87.2	23	88.5
Seizure	72	51.1	12	46.2
Neck Rigidity	53	37.6	14	53.8
Neurological Deficit	41	29.1	5	19.2

Table 2: Clinical Presentation of AES and JE cases

Year	Duration	Study by	Region	Population Studied	Total AES (Tested for JE)	Total JE
Jan 1995 to Dec 1997	24 Months	Avabratha KS et al ⁵	Bellary, Karnataka	< 12 Years Age	NR	233
Aug to Sep 2005	2 Months	Kumar R et al ⁶	Lucknow, UP	6 Month to 12 Years	278(223)	77(34.5%)
Jan 2006 to Jan 2008	24 Months	Rayamajhi A et al ⁷	Kathmandu, Nepal	1 to 14 years	225(185)	42(22.7%)
Jan 2008 to Jan 2010	25 Months	Borah J et al ³	Dibrugarh, Assam	All Age Groups	550(550)	259(47.1%)
Jan 2010 to Dec 2010	12 Months	Thapa LJ et al ⁸	Birgunj, Nepal	All Age Groups	85(85)	4(4.7%)
Jan 2010 to Dec 2011	24 Months	Dongol S et al ⁹	Dhulikhel, Kavre, Nepal	< 15 Years Age	47(47)	1(2.1%)
Jan 2011 to June 2012	18 Months	Kakkar M et al ¹⁰	Kushinagar, UP	All Age Groups	812(131)	3(2.3%)
Jan 2011 to Dec 2012	24 Months	Bandyopadhyay B et al ¹¹	Calcutta, WB	All Age Groups	606(606)	74(12.2%)
May 2011 to April 2012	12 Months	Patgiri SJ et al ⁴	Dibrugarh, Assam	All Age Groups	424(424)	194(45.8%)
Mar 2012 to Dec 2012	10 Months	Kakoti G et al ¹	Dibrugarh, Assam	< 12 years	223(223)	67(30%)
Aug 2012 to Nov 2013	14 Months	Singh AS et al ¹²	Lucknow, UP	All Age Groups	456(456)	110(24.1%)
Jan 2013 to Dec 2013	12 Months	Sharma J et al ¹³	Dhemaji, Assam	All Age Groups	48(48)	9(23.1%)
May 2014 to Oct 2014	6 Months	Our study	Dibrugarh, Assam	Adults above 12 years	141(141)	26(18.4%)

Table 3: Studies Published on AES and JE from India

DISCUSSION: AES is reported mainly from Assam, Bihar, Karnataka, Tamil Nadu and Uttar Pradesh which contributes approximately 80% of cases. The causative organism varies with geographic locations and seasons. Japanese encephalitis (JE) is considered as a main viral aetiology of patients with AES. Other causes are West Nile encephalitis, Dengue, Chikungunya, Fungal infections, Parasites, Spirochetes, chemical/toxins etc. Table no (3) three mentions various reported studies from India. Kakkar M et al¹⁰ from Kushinagar district in Uttar Pradesh studied 721 cases of AES in 2011 and 91 cases in January to June 2012, and found 44.7% were below 5 years of age. Avabratha KS et al⁵ Kumar R et al⁶ Rayamajhi A et al⁷ Dongol S et al⁹ and Kakoti G et al¹ have extensively reported AES and JE cases in paediatric population. Borah J et al³ reported 550 cases of AES from North East India with 259 (47.1%) serologically JE

positive, of which 66.4% were adults and 33.6% were paediatric.

Patgiri S et al⁴ from upper Assam studied 424 patients of AES (from May 2011 to April 2012), 144 below the age of 15 years and 280 adults >15 years and found JE in 41(28.47%) and 153(54.6%) patients respectively concluding that occurrence of JE in adults was substantially higher in adults. We studied 141 adult AES cases in six months and found 26(18.4%) JE positive which is lower than most studies (vide Table no 3).

Borah J et al³ found fever as the most common presentation but neck rigidity, convulsions and abnormal behaviour was higher in paediatric group. Patgiri S et al⁴ found fever in all cases of JE, headache in 69%, convulsion in 41.6%, neck rigidity in 54.6% and unconsciousness in 43.3% cases. Kakoti G et al¹ found fever in 100%, altered

sensorium in 83.6, seizure in 82.1%, meningeal irritation in 55.2%, headache in 41.8% and vomiting in 29.9%. Kakkar M et al¹⁰ found 83.33% were having the complaint of fever and change in mental state; 4.17% encompass fever, irritability and convulsion like symptoms whereas remaining 12.5% were having high grade fever. We found fever, headache, vomiting, altered sensorium and dizziness in most of the cases whereas seizure, neck rigidity and neurological deficits were less common.

Patgiri S et al⁴ found mean hospital stay in those who had favourable outcome (n=136) 7.72 days (SD \pm 4.09) and those who expired (n=58) 3.88 days (SD \pm 2.64). We found average hospital stay of 5.87 days (SD \pm 3.237). Kakoti G et al¹ saw that among the available 61 confirmed JE patients, 39 (63.9%) were recovered completely, while 13 (21.3%) cases had neurological sequelae at the time of discharge. 9(14.7%) patients died in the hospital. Rayamajhi A et al⁷ found that among the AES patients with suspected viral infection, 45/145 (31%) had a bad outcome; 8 died and 37 had neurological sequelae at discharge.

Among the subset of confirmed JE patients, 20/42 (48%) had a bad outcome; 4 died and 16 had neurological sequelae. Patgiri S et al⁴ recorded an overall mortality of 29.9% (58 deaths in 194 cases) in JE positive cases. The mortality rate was found to be 34.6% (53 deaths in 153 cases) in adults and 12.2% (5 out of 41 cases) in the paediatric age group, the difference being significant (P=0.005). The mortality was also higher in the JE positive cases when compared to non-JE AES cases (29.9% vs. 16.52%, P = 0.001). Our study showed 62 (44%) patients with AES improved, 41(29.07%) suffered residual neurological deficit and 38(26.65%) expired. 14 (53.84%) patients with JE positive improved, 9(34.61%) suffered residual neurological deficit and 3(11.53%) expired.

Kumar R et al⁶ reported GCS score of < 7 in almost 45% of our patients again reflects the very severe illness. Kakati G et al¹ found around 40.29% of JE patients had GCS within 3 to 8. We found that out of 38 patients who died, 76.31% patients had a GCS \leq 7. Sharma J et al¹³ found vaccination coverage in only 6.25% of total AES cases. 22.22% of JE positive cases were JE vaccinated and the remaining 77.78% were not vaccinated with JE vaccine. Kakati G et al¹ also noted that vaccination program did not cover 80.5% of the AES patients. Kakkar M et al¹⁰ noted vaccination status of 3 (2.6%) out of 119 case reported. The Dibrugarh District Adult Vaccination 2014 campaign shows coverage of 93.03%, but we also found low vaccination coverage of 4.96% in AES patients.

CONCLUSION: We conclude that JE positive cases have reduced in adults AES patients after Government vaccination program, but the vaccination coverage was low in AES patients. We also conclude that clinical presentation of adult AES patients differ from most reported paediatric AES cases. However, the mortality and morbidity of AES and JE still remains high, GCS < 7 being a bad prognostic marker.

REFERENCES

1. Kakoti G, Dutta P, Ram das B, et al. Clinical profile and outcome of Japanese encephalitis in children admitted with acute encephalitis syndrome. *Biomed Res Int* 2013;pgs. 5.
2. Soloman T, Thao TT, Lewthwaite P, et al. A Cohort study to assess the new WHO Japanese encephalitis surveillance standards. *Bull World Health Organ* 2008,86(3):178-186.
3. Borah J, Dutta P, Khan SA, et al. A comparison of clinical features of Japanese encephalitis virus infection in the adult and paediatric age group with acute encephalitis syndrome. *Journal of Clinical Virology* 2011;52(1):45-49.
4. Patgiri S, Borthakur A, Borkakoty B, et al. An appraisal of clinicopathological parameters in Japanese encephalitis and changing epidemiological trends in upper Assam, India. *Indian Journal of Pathology and Microbiology* 2014;57(3):400-406.
5. Avabratha KS, Sulochana P, Nirmala G, et al. Japanese encephalitis in children in Bellary Karnataka: clinical profile and sequelae. *International Journal of Biomedical Research* 2012;3(2):100-105.
6. Kumar R, Tripathi P, Singh S, et al. Clinical features in children hospitalized during the 2005 epidemic of Japanese encephalitis in Uttar Pradesh, India. *Clinical Infectious Diseases* 2006;43(2):123-131.
7. Rayamajhi A, Singh R, Prasad R, et al. Study of Japanese encephalitis and other viral encephalitis in Nepali children. *Pediatr Int* 2007;49(6):978-984.
8. Thapa LI, Twayana RS, Shilpakar R, et al. Clinical profile and outcome of acute encephalitis syndrome (AES) patients treated in college of medical science-teaching hospital. *Journal of College of Medical Science –Nepal* 2013;9(2):31-37.
9. Dongol S, Shrestha S, Shrestha N, et al. Clinical profile and outcome of acute encephalitis syndrome in Dhulikhel hospital of Nepal. *J Nepal Paediatr Soc* 2012;32(3):201-205.
10. Kakkar M, Rogawski ET, Abbas SS, et al. Acute encephalitis syndrome surveillance, Kushinagar district, Uttar Pradesh, India 2011-2012. *Emerging Infectious diseases* 2013;19(9):1361-1367.
11. Bandyopadhyay B, Bhattacharyya I, Adhikary S, et al. Incidence of Japanese encephalitis among acute encephalitis syndrome cases in west Bengal, India, *Bio Med Research International* 2013;pgs.5.
12. Singh AS, Tripathi P, Khan SF, et al. Non-neurological manifestations in acute encephalitis syndrome in Uttar Pradesh India. *J Neuroinfect Dis* 2014;5(2):143.
13. Sharma J, Baruah MK, Pathak A, et al. Epidemiology of Japanese encephalitis cases in Dhemaji district of Assam, India. *Annals of Biological Research* 2014;5(1):50-54.