

Original Research Article

A study on epidemiological pattern of acute encephalitis syndrome with special reference to Japanese encephalitis in Patna medical college and hospital, Patna, Bihar, India

Anil Kumar Tiwari, Anil Kumar Jaiswal, Tauhid Iqbali*

Department of Pediatrics, Patna Medical College and Hospital, Patna, Bihar, India

Received: 28 April 2017

Accepted: 04 May 2017

***Correspondence:**

Dr. Tauhid Iqbali,

E-mail: tau.cool2001@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Acute Encephalitis Syndrome (AES) is defined as a person of any age, at any time of year with the acute onset of fever and a change in mental status (including symptoms such as confusion, disorientation, coma, or inability to talk) and/or new onset of seizures (excluding simple febrile seizures). Viruses have been mainly attributed to be the cause of AES in India although other etiologies such as bacteria, fungus, parasites, spirochetes, leptospira, toxoplasma, rickettsia, chemical, and toxins have also been reported over the past few years. The causative agent of AES varies with season and geographical location, owing to wide range of causative agents and the rapid neurological impairment due to pathogenesis, clinicians face the challenge of a small window period between diagnosis and treatment. The present study is dedicated to knowing the present epidemiological pattern of AES in Bihar aiming to help in diagnosis and treatment.

Methods: This is a prospective study conducted in the department of pediatrics, Patna Medical College and Hospital, Patna from January 1st to December 31st, 2016, in this study all cases which presented with acute onset of fever and a change in mental status including symptoms such as confusion, disorientation, coma or inability to talk and/ or new onset of seizures excluding simple febrile seizures were included. Demographic, etiological analysis and outcome of cases of Acute Encephalitic Syndrome as well as Japanese encephalitis were done.

Results: The total number of patient diagnosed clinically with AES were 186 of them 105 were male and 81 were female. Number of cases were highest in the age group of >5-10 years amounting to 37.7% followed by 26.4% in >2-5 years age group, marked male predominance was seen in the age group 5 -10 years. A minor female predominance was observed in the age group >10 years. In May number of cases were maximum 36 (19.4%) followed by April 32 (17.2%), number of cases of AES were least in the month of December followed by November (8). Maximum number of cases were from the district of Patna and its neighboring district amounting to 58.5% with Nalanda district alone comprises 24.3%. Etiological analysis reveals that 36.5% children admitted with the clinical diagnosis of AES, 36.5% were diagnosed with Acute bacterial meningoencephalitis and 22.04% were diagnosed with Japanese Encephalitis, 7.5% Tuberculous meningitis, 6.4% Cerebral malaria, 5.4% Herpes simplex encephalitis and 3.2% with acute encephalitis syndrome unknown.

Conclusions: Acute Encephalitis Syndrome remains an important cause of prolonged hospital bed occupancy with a high rate of mortality. Although in JE positive cases mortality were less, but morbidity in form of various motor deficit and cognitive impairment increases the burden on the family and society. With the introduction of effective JE vaccine and with rigorous surveillance of AES cases and social initiative taken by the Government, we can hope a better scenario. More and more extensive studies are the need of hour to know more about the etiopathogenesis of AES, so that future strategies to bring down the mortality and morbidity due to this disease can be carried out.

Keywords: Acute encephalitis syndrome, Epidemiological, Geographical, Leptospira, Patna, Rickettsia

INTRODUCTION

Clinically, a case of Acute Encephalitis Syndrome (AES) is defined as a person of any age, at any time of year with the acute onset of fever and a change in mental status (including symptoms such as confusion, disorientation, coma, or inability to talk) and/or new onset of seizures (excluding simple febrile seizures). Other early clinical findings may include an increase in irritability, somnolence or abnormal behaviour greater than that seen with usual febrile illness.¹

Viruses have been mainly attributed to be the cause of AES in India although other probable causes such as bacteria, fungus, parasites, Spirochetes, Leptospira, Toxoplasma, certain chemicals, and toxins have been reported over the past few decades.¹

Japanese Encephalitis is one of the type of AES which is caused by a virus transmitted by bites of female mosquitoes mainly belonging to Culex species.

This virus is maintained in animals, birds and pigs. Originally it was thought that Japanese Encephalitis and AES cases are seasonal in nature, but Patna Medical College and Hospital being a tertiary centre with vast catchment area covering the whole state of Bihar, parts of Jharkhand, Uttar Pradesh and Nepal, cases with features like AES are admitted throughout the year. With increased facility of laboratory care in Patna Medical College and Hospital. All cases with clinical features of AES were investigated for final diagnosis.

METHODS

The study was conducted in the Department of Pediatrics, Patna Medical College and Hospital Patna.

All the cases of any age admitted from 1st January 2016 to 31st December 2016 with features of acute onset of fever and a change in mental status including symptoms such as confusion, disorientation, coma or inability to talk and/or new onset of seizures excluding simple febrile seizures were included in the study. All such cases were examined clinically in detail including keeping in mind all the probable differential diagnosis and findings recorded. Blood samples for complete blood count, blood sugar, renal function test, electrolytes, liver function test and for JE virus IgM ELISA, Dengue, Leptospira etc. were collected on day one and sent in the Laboratory.

Blood smear for Malarial Parasites and Optimal test and test for Enteric fever were done. Samples for blood cultures were also taken. As soon as the clinical conditions permitted Lumbar punctures were done after due formalities with strict aseptic measures and samples collected was analyzed for cytology, protein levels, glucose to blood glucose ratio, gram stain, and culture sensitivity for microbes.

Blood samples/CSF was examined on day 1 and day 5-7 for JE serology. Montoux test were done, Chest X-ray, CECT brain/MRI Brain as and when required were done.

RESULTS

There was a total of 10470 patients admitted in the study period, out of these 186 (1.77%) were diagnosed clinically with AES.

Month wise distribution of cases were maximum in May amounting to 36 (19.4%), followed by April 32 (17.2%), January 18 (9.67%), February and March 16 (8.6%) each, August and September 14 (7.5%) each, October 11 (5.9%), and in July, June, November and December 10 (5.3%), 9 (4.8%), 8(4.3%), 2 (1.08%) respectively (Figure 1).

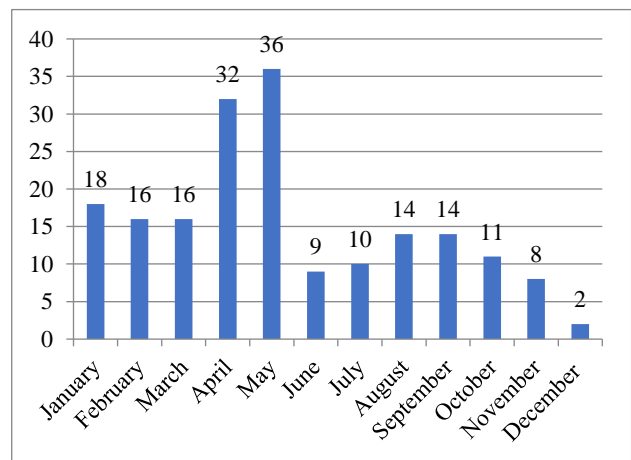


Figure 1: Month wise case distribution of AES.

Number of cases were highest in the age group of >5-10 years amounting to 37.7% followed by 26.4% in >2-5 years age group, 19.3% in >10 years age group, 10.2% in the age group 2 months-1 years, and 6.4% in >1- 2 years' age group.

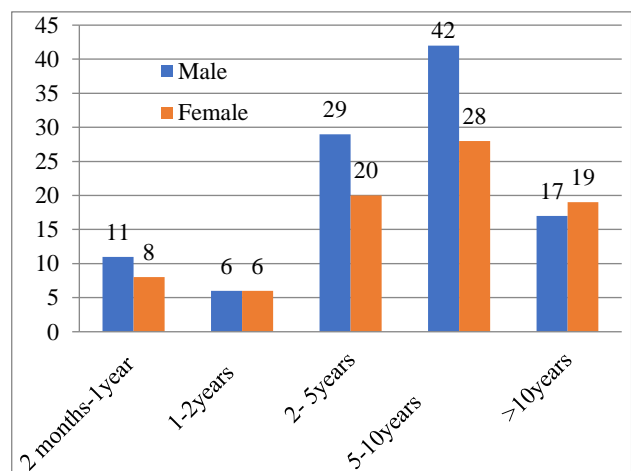


Figure 2: Age and sex wise distribution of cases of AES.

A minor male predominance was found in the age group of 2 months-1 year and >2 -5years. Marked male predominance was seen in the age group 5-10 years. A minor female predominance was observed in the age group >10 years, while an equal sex ratio was observed in 1-2 years' age group (Figure 2).

Out of 186 children admitted with clinical diagnosis of AES, 36.5% were diagnosed with Acute bacterial meningoencephalitis and 22.04% were diagnosed with Japanese Encephalitis. 7.5% Tuberculous meningitis, 6.4% Cerebral Malaria, 5.4% Herpes Simplex encephalitis and 3.2% were diagnosed with Acute Encephalitis Syndrome Unknown. 9.1% cases constitute other group comprising of Septicemia, Electrolyte imbalance, Neurocysticercosis, ADEM, Enteric encephalopathy, Dengue etc. (Figure 3).

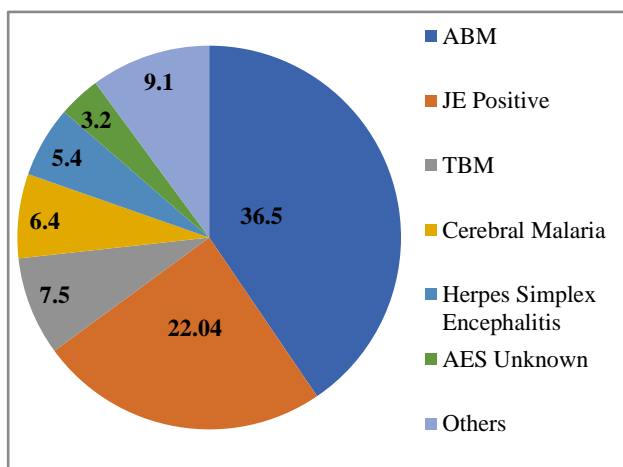


Figure 3: Etiological diagnosis of children with AES.

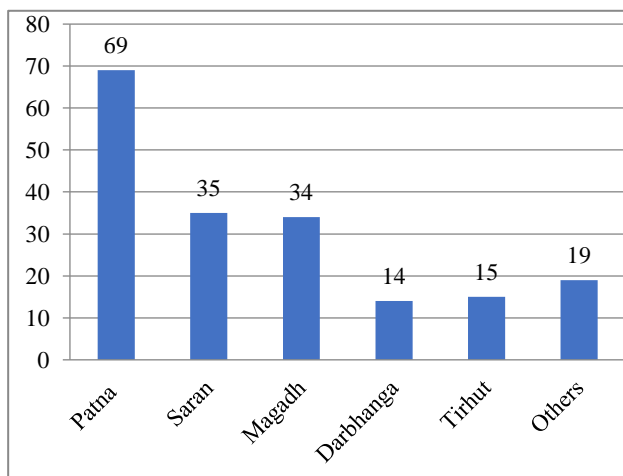


Figure 4: Divisional area wise case distribution of AES.

Maximum number of cases belonged to the district of Patna and their neighboring district amounting to 58.5% with Nalanda district alone comprises 24.3%. 69 (37.01%) cases were from Patna division, 35 cases

(18.80%) were from Saran division and 34 cases (18.27) were from Magadh division, 14 and 15 cases were from Darbhanga and Tirhut division respectively and the rest 19 cases were from other divisions (Figure 4).

Outcome was favorable in children diagnosed with Japanese Encephalitis positive as 66% of them were discharged, whereas overall discharge rate of children admitted with the clinical diagnosis of AES was 51%. The overall mortality of children diagnosed clinically as AES was 35% against 22% in those diagnosed with Japanese Encephalitis (Figure 5 and Figure 6).

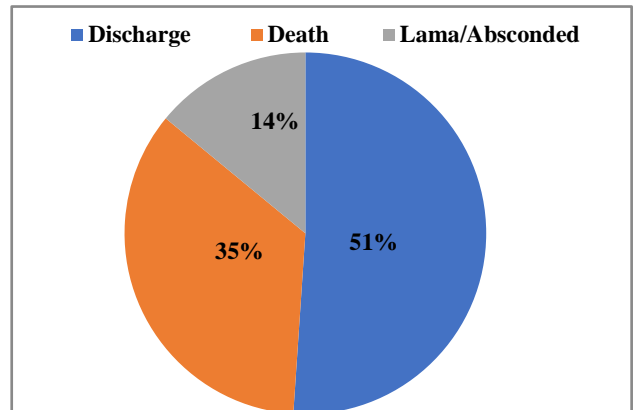


Figure 5: Outcome of cases of AES.

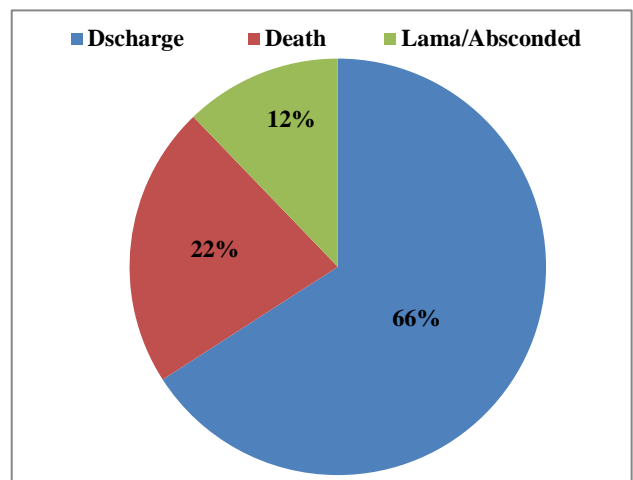


Figure 6: Outcome of cases of Japanese encephalitis.

DISCUSSION

Very few studies have been done so intensively. In a similar study done in Bihar by Ragini Mishra et al AES constituted 2% of Hospital admission as against our finding of 1.77% with maximum age group being 0-4 years unlike our finding in which maximum patient belongs to >5-10 years age group followed by 2-5 years and just like us in present study they also had male predominance.²

In a study from BRD Medical college, Gorakhpur in adult patients AES incidence was found to be 11.56% and other etiological diagnosis were almost similar although the incidence varied. This may be due to age group variation.³

In a similar study from BRD Medical College, Gorakhpur, Non-Polio Enteroviral Encephalitis was found in 80% cases, Japanese Encephalitis in 10-15% cases, Acute Bacterial Meningoencephalitis in 2-3% and TB meningitis in 1-2% cases.⁴ In a western study the incidence of AES was found to be 10.5-13.8/100000 populations.⁵ In a study from Kolkata by Bhaswati Bhattacharya et al the incidence of JE was found 12.21%.⁶ In a cohort study by Tom Solomon et al WHO JE surveillance standard study focus was on JE Positive or Negative or AES unknown mortality was 18.68% in JE positive cases which is almost similar to this study. In 22% cases AES Unknown diagnosis was made, while in this study AES Unknown was found in 3.2%.⁷ The incidence of JE positive case is 22.04% in the present study. In a study from Assam, India, JE positive cases were found 33.6%.⁸

CONCLUSION

Acute Encephalitis Syndrome remains an important cause of prolonged hospital bed occupancy with a high rate of mortality. Although in JE positive cases mortality were less, but morbidity in form of various motor deficit and cognitive impairment increases the burden on the family and society. With the introduction of effective JE vaccine and with rigorous surveillance of AES cases and social initiative taken by the Government, we can hope a better scenario. More and more extensive studies are the need of hour to know more about the etiopathogenesis of AES so that future strategies bring down the mortality and morbidity due to this disease.

ACKNOWLEDGEMENTS

Authors would like to thank the Department of Pediatrics as well as ethical committee, Patna Medical College and Hospital for permitting them to do this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Ghosh S, Basu A. Acute Encephalitis Syndrome in India: The Changing Scenario, Ann Neurosci. 2016; 23(3):131-3.
2. Mishra R, Kumar G, Epidemiological Report on Acute Encephalitis Syndrome (AES)/Japanese Encephalitis (JE) Outbreak in Bihar and Planning Perspectives for Its Control. Americ J Health Res. 2014;2(6):404-10.
3. Kumar R, Bhushan M, Nigam P. Pattern of Infection in adult patients presenting as AES. Internat J Medic Sci Educat. 2014;1(4):56-1.
4. Kumar R. Clinical Profile and Outcome of Japanese Encephalitis and Non- Japanese Encephalitis Adults Admitted with Acute Encephalitis Syndrome: A comparative prospective cohort study, B.R.D Medical College, Gorakhpur, Uttar Pradesh, Sch. J. App. Med. Sci. 2015;3(5D):2038-45.
5. Bandyopadhyay B, Bhattacharyya I, Adhikary S, Mondal S, Konar J, Dawar N, Biswas A, Bhattacharya N. Incidence of Japanese encephalitis among acute encephalitis syndrome cases in West Bengal, India. BioMed research international. 2013; 2013.
6. Solomon T, Thao TT, Lewthwaite P, Ooi MH, Kneen R, Dung NM, et al. A cohort study to assess the new WHO Japanese encephalitis surveillance standards, Bull World Health Organ. 2008;86(3):178-86.
7. Jmor F, Hedly CA, The Incidence of AES in Industrialized and Tropical countries, Virol J. 2008;5:134.
8. Borah J, Dutta P, Khan SA, Mahanta J. A comparison of clinical features of Japanese encephalitis virus infection in the adult and pediatric age group with Acute Encephalitis Syndrome. J Clinic Virol. 2011;52(1):45-9.

Cite this article as: Tiwari AK, Jaiswal AK, Iqbali T. A study on epidemiological pattern of acute encephalitis syndrome with special reference to japanese encephalitis in Patna medical college and hospital, Patna, Bihar, India. Int J Contemp Pediatr 2017;4:1210-3.