



LABORATORY PROFILE OF INDOOR PATIENTS ADMITTED WITH ACUTE ENCEPHALITIC SYNDROME IN A TERTIARY CARE CENTRE OF NORTH-BENGAL

General Medicine

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ABSTRACT

Background: Acute encephalitis syndrome (AES) is defined as the acute-onset of fever and a change in mental status (including signs and symptoms such as confusion, disorientation, delirium or coma) and/or new-onset of seizures (excluding simple febrile seizures) in a person of any age at any time of the year. Most AES is considered to be due to a viral-encephalitis, virus like West Nile, Herpes simplex virus, Flavivirus like JE and dengue are more prevalent in South East Asia. **Methods:** This observational Cross sectional Study was conducted in the indoor patients of Department of Medicine at Tertiary care Hospital in North Bengal from May 2013 to April 2014. All consecutive patients of AES admitted during this period were included in the study. The study region covers the various districts of North Bengal. Template was generated in MS excel sheet and analysis was done on SPSS 20.0 software.

Results: Among 104 acute encephalitis syndrome patients, 68 (65.38%) were male and 36 (34.62%) were female. The majority of pts (54.81%) were >40yrs of age. The lowest wbc count was 3000/cumm and highest was 21,200/cumm with mean wbc count being 10462.56±3567.832/cumm. A significant number 56 (53.85%) of patients had serum potassium levels between 2.5-3.5meq/dl. The no. of JE Positive patients was 75 (72.12%) which may be due to the local endemicity of the disease

Conclusions: Majority of cases were in the age-group of more than 40 years, with male predominance. The no. of JE Positive patients was 75 (72.12%) which may be due to the local endemicity of the disease.

KEYWORDS

AES, CSF, Dengue, JE

INTRODUCTION :

The cardinal manifestations of the acute encephalitis syndrome consists of acute onset fever with evidence of meningeal signs (sometimes headache)¹, added to which are various combinations of the following symptoms and signs: convulsions, delirium, confusion, stupor, or coma; aphasia; hemiparesis with asymmetry of tendon reflexes and Babinski signs²; involuntary movements, ataxia, and myoclonic jerks; nystagmus, ocular palsies, and facial weakness³.

Viral encephalitis can present in forms of low or mild severity that heal spontaneously or in much more aggressive forms with a poor prognosis and severe neurological sequelae in survivors. The prodromal signs and symptoms are those of a classic viral infection: fever and headache, possibly accompanied by lymphadenopathy, nausea or vomiting⁴. After a few days, symptoms of CNS involvement become manifest with altered mental status, considerable irritability and agitation, personality changes; seizures (focal or generalized) may occur, sometimes accompanied by focal neurological signs. Patients may then become lethargic or comatose; death eventually ensues. Stiff-neck is a sign of meningeal involvement⁴ and poor prognosis.

The incidence of common etiologies of AES in India is fragmented. However this condition is not uncommon and carries with it high morbidity and mortality. This study though still a fragmented one will help in accumulating baseline data regarding laboratory study profile and etiologies from this part of country.

Present study is carried out with the objective to evaluate the clinical profile of hospitalized AES cases, to determine the prevalence and outcome of AES in this part of North Bengal.

AIMS AND OBJECTIVES

This study deals with patients admitted with Acute Encephalitis Syndrome in Dept of Medicine North Bengal Medical College. The study deals with the laboratory investigation profile of patients with AES and Japanese Encephalitis. The study was conducted from May 2013 to April 2014. All patients fulfilling inclusion criteria after

informed consent was included in the study. Present study was carried out with the objective to evaluate the laboratory investigations associated with it in this part of North Bengal.

MATERIALS AND METHODS

An Observational Cross sectional Study was conducted in the indoor patients of Department of Medicine at Tertiary care Hospital in North Bengal. All consecutive patients of AES admitted during this period were included in the study. The study region covers the various districts of North Bengal.

INCLUSION CRITERIA:

Patients >12yrs with diagnosed as a case of AES (as defined by acute onset alteration of sensorium with fever of recent onset i.e. 1 week or less duration).

EXCLUSION CRITERIA:

- Fever of more than 1 week duration.
- Patients with Cerebral Malaria, Metabolic Encephalopathy, Cerebrovascular Accidents, ICSOL, Sepsis.
- Those not giving consent for study.
- Those left against medical advice and failed to follow up.

PARAMETERS TO BE STUDIED

- Complete Hemogram
- Serum Sodium and Potassium
- Blood Glucose
- Serum Urea and Creatinine
- Liver Function Tests
- CSF STUDY including cell type & count, sugar, protein, gram
- CSF MAC ELISA for JE virus (Version 1.4; manufactured by NIV, Pune)
- Serum Typhi Dot IgM, Leptospira antibody; IgM Dengue ELISA; IgM scrub Typhus.

All patients who were meeting inclusion criteria after informed consent were included in the study and subjected to detailed history

and thorough clinical examination followed by blood examinations and lumbar puncture for CSF analysis and brain imaging by MRI Brain with Contrast. The internal quality of tests will be kept by the respective department of Pathology Biochemistry, Microbiology and Radiology NBMCH. All patients were treated as per standard treatment protocol during study period.

PLAN FOR ANALYSIS OF DATA

Data was entered in Excel Microsoft Software to prepare Master table and is being presented in various tables, charts and diagrams. The data was then analyzed using SPSS statistical software V 12.2.

RESULT and ANALYSIS

A total of 104 patients of acute encephalitis syndrome were included on this study (after fulfilling inclusion and exclusion criteria). Patients underwent clinical examination as required. The patients were selected from general medicine indoor wards. In this study males dominated the clinical picture with 68 out of 104 pts (65.38%).

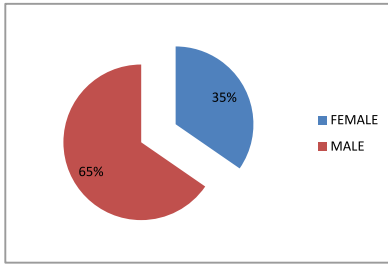


Fig 1 : Distribution of patients according to their gender.

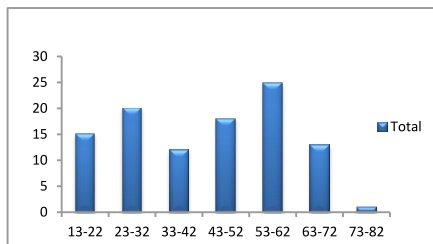


Fig 2 : Distribution of patients according to their age.

The majority of pts (54.81%) were >40yrs of age as depicted above figure. Mean age of patients was 43.60±17.23 yrs.

The lowest wbc count was 3000/cumm and highest was 21,200/cumm with mean wbc count being 10462.56±3567.832/cumm.

Table 2 : Distribution of patients according to their Serum Potassium Levels:

POTASSIUM LEVELS (in meq/dl)	NO. OF PATIENTS (n=104)	PERCENTAGE
2-2.5	4	3.85%
2.5-3	23	22.12%
3-3.5	33	31.73%
3.5-4	17	16.35%
4-4.5	13	12.50%
4.5-5	7	6.73%
5-5.5	6	5.77%
5.5-6	1	0.96%

A significant number 56 (53.85%) of patients had serum potassium levels between 2.5-3.5meq/dl which was an interesting finding in this study.

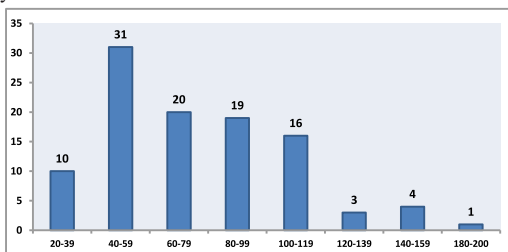


Fig 3: Serum SGOT(AST) Levels in AES patients

The mean SGOT(AST) levels were 74.48± 32.23 iu/ml. 43 pts had SGOT levels > 2 times the limit (i.e 40iu/l).

CSF STUDY:

The mean csf cell count was 34.04±66.66 cells/ml of csf . 77 pts(74.4%) had a csf cell count between 5-24cells. There was **lymphocytic predominance** with mean lymphocyte composition being 94.25±8.2% .

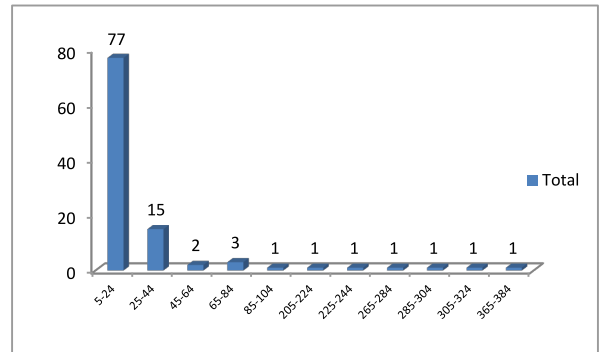


Fig 4: Distribution of patients according to their CSF Cell Count

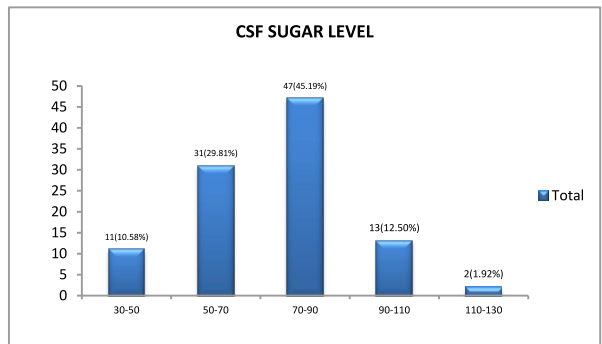


Fig 5: Distribution of patients according to their CSF Sugar Level

The mean CSF sugar was 73.37±17.43 mg/dl. 45.19% patients had sugar level of 70-90 mg/dl.

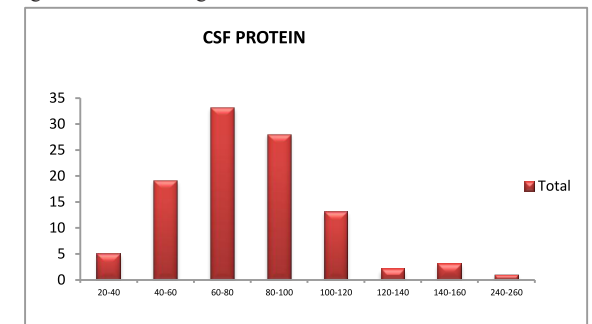


Fig 6: Distribution of patients according to their CSF Protein Level in AES patients

Table 3 : Distribution of patients according to their Protein Levels.

PROTEIN LEVEL (in md/dl)	NO. OF PATIENTS (n=104)	PERCENTAGE
20-40	5	4.81%
40-60	19	18.27%
60-80	33	31.73%
80-100	28	26.92%
100-120	13	12.50%
120-140	2	1.92%
140-160	3	2.88%
240-260	1	0.96%
Grand Total	104	100.00%

The mean CSF protein was 79.33± 30.47 mg/dl. 58.65% patients had csf protein count between 60-100 mg/dl.

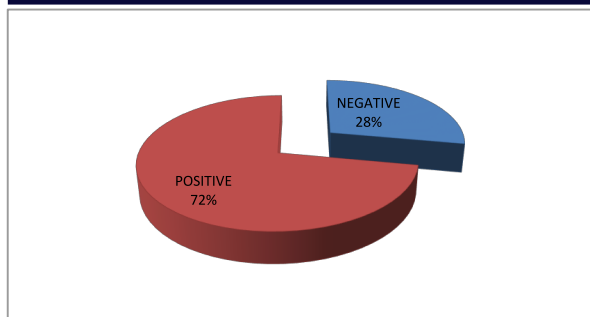


Fig 7: Distribution Of Patients According To Their Je Mac-eisa Seropositivity

Table 4 : Distribution of patients according to their JE MAC-ELISA Levels.

JE MAC-ELISA	NO. OF PATIENTS (n=104)	PERCENTAGE
NEGATIVE	29	27.88%
POSITIVE	75	72.12%
Grand Total	104	100.00%

The no. of JE Positive patients was 75(72.12%) which may be due to the local endemicity of the disease.

DISCUSSION :

Population based studies have shown that mean total count is usually higher in patients of acute encephalitis syndrome. In a hospital based study by Amit Singh et al a mean total count in Non JE AES and JE +ve patients was compared.⁵ The mean count for JE+ve patients was 15979.4/mm³ and non-JE AES patients was 13501.5 ± 8336.9/mm³. Shailendra et al in a study for JE patients found a mean total count of 8416.7 ± 1192.6 /mm³ along with peripheral leucocytosis (64.7 ± 8.86% neutrophils).⁵

In our study the mean total count was 10462.56±3567.832/mm³ overall with mean total count in JE+ve patients being 10787.33±3530.39/mm³ which was slightly lower than that found by Singh et al but higher than that observed by Shailendra et al.^{5,6}

CSF picture in patients of AES is predominantly characterized by lymphocytic pleocytosis with a mildly raised protein level and normal or slightly reduced csf sugar. Study conducted by Kumar et al showed that CSF protein was raised above 40 mg/dl in 24 cases (28.3%) with maximum protein level was 120 mg/dl and mean 49 mg/dl.⁷ CSF sugar was within normal limits in all patients. CSF was examined in 85 of the 92 patients. Pleocytosis in the CSF was found in 28 (32.3%) patients, the cell count ranged from 30-360/mm³. In 15 of these the pleocytosis was predominantly polymorphonuclear and in 13 predominantly lymphocytic.

Study by Prasad et al where CSF was analyzed in 7 of the 19 patients showed lymphocytic pleocytosis (20-40 cell/mm³). Proteins were moderately raised in 6 patients (46-75 mg/dl). Sugar levels were within normal.⁸

In our study the mean CSF count was 34.04±66.66 cells/ml with a lymphocytic pleocytosis with mean lymphocyte composition being 94.25±8.2% of total cells, which was similar to above studies. The mean CSF protein was 79.33± 30.47 mg/dl with 58.65% patients had csf protein count between 60-100 mg/dl and mean CSF sugar being 73.37±17.43 mg/dl which was slightly higher than normal limits(40-70mg/dl).

An interesting finding in our study was low serum potassium in majority of patients. The mean serum potassium level was 3.49±0.77 mmol/l. 56 (53.85%) had serum potassium levels between 2.5-3.5meq/dl. In a study conducted by Rayamajhi et al the mean potassium level was 3.49mmol/l in patients with non JE patients and 4.3mmol/lit in JE+ve patients.

In this study a significantly high number of patients were tested positive for JE IgM antibody and it was the most common etiological agent in this study. There were 75 patients making 72.12% of total who were JE +ve. JE has been emerging as the most common cause of acute

encephalitis syndrome in India. The cause for this in this study may be due to local endemicity and close proximity to JE endemic region such as the state of Bihar. Also huge population migration with availability of potential breeding sites for mosquitoes and local pig rearing at homes could be dominating cause.

In a study done by Rayamajhi et al in Nepal only 23% were tested positive for JE.⁸ Another study by Karmakar et al only 8.7% were tested positive for JE.⁹ In another epidemic outbreak study by Shailendra et al 55.3% patients were tested positive for JE.⁶ The number of patients with JE positivity was in our study was much higher than above study which could be due to surge in vector density or increased contact with virus in hidden pockets.

Presence of JE seropositivity was a poor prognostic factor in our study with 24 out of 75 patients tested positive had death as outcome. This association was statistically significant (p value 0.002).

CONCLUSION :

This may be mentioned here that our observation is only from a small number of patients. In future with more number of patients we may be able to shed some more light on Acute Encephalitic Syndrome and its association.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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