

# A Study Of Renal Function Test, Liver Function Test, ECG Changes And Their Prognostic Outcome In The Patients Of Japanese Encephalitis In Jharkhand

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**Abstract- Background and objectives :** Japanese Encephalitis is a mosquito borne disease and leading cause viral encephalitis in India. In INDIA, the states which has high number of cases are UTTAR PRADHESH > ASSAM > BIHAR > KARNATAKA...etc. It usually affect the low socio-economic people and rural areas. We present the Renal Function Test, Liver Function Test , Ecg Changes and Their prognostic Outcome in the patient of Japanese Encephalitis In Jharkhand. **Methods :** This Study was done on 18 Japanese Encephalitis which was confirmed through CSF IgM Ab in the Microbiology department of RIMS Ranchi. The Renal profile, Liver profile and Ecg Changes were studied. **Results :** Out of 18 Patients, 27.77% of cases had serum creatinine >2.1 mg/dl. About 22.22% cases came under 1.1-2 mg/dl of serum creatinine group. And about 50% of cases had serum creatinine <1 mg/dl. About 5.55% of cases had total bilirubin >2.1 mg/dl, about 33.33% of cases had total bilirubin between 1.1-2 mg/dl and 61.11% had total bilirubin <1 mg/dl. About 33.33% cases had LAD ( Left Axis Deviation), 16.66% cases had RAD( Right Axis Deviation) and 50% cases were normal. Out of 18 JE patients, 14 patients were discharged and 4 were dead. **Conclusion :** According to data collected in our study, we further recommend more studies on these parameters for better prognosis and outcome in the patient of Japanese Encephalitis.

**Index Terms-** Japanese Encephalitis , Renal Function Test , Liver Function Test , Ecg Changes , Prognostic Outcome , Jharkhand

## I. INTRODUCTION

Japanese Encephalitis is a mosquito borne flavivirus disease which is most commonly found in South Asian countries . It is usually start with fever , headache, nausea and vomiting. After prolonged fever of 2 weeks altered sensorium start, which is sign of aseptic meningitis. The source of infection is irrigated rice field . Most common mosquito associated with JE is Culex Tritaeniorhynchus. Amplifying agents are pigs and horses . Vaccination in amplifying agent will definitely reduce the growth of virus. The main objective of the study were to find out the Renal - Liver - ECG changes in the patients of Japanese Encephalitis.

### Pathogen

The family Flaviviridae contains only one genus, Flavivirus. They are smaller than alphaviruses, being 40 nm in diameter. The name Flavivirus refers to the yellow fever virus ( flavus in Latin means yellow) [1] . Flavivirus sensu stricto have single stranded positive sense RNA genomes ( 11KB ) and form spherical enveloped particles 40-60 nm in diameter. Vectors are usually infected when they feed on viremic hosts ; humans are accidental hosts who usually are infected by arthropod bites [2] .

### Epidemiological Pattern Indian Setting

In India, Japanese Encephalitis was first recognized in 1955 when the virus was isolated from mosquitoes of the Culex Vishnui complex from Vellore during outbreak of encephalitis in Tamil Nadu [3] . It usually common in children. Most of the cases occur in rainy season I.e around July to October.

### **Diagnosis**

1. The ideal method for laboratory confirmation is testing cerebrospinal fluid (CSF) or serum for JEV specific IgM antibody.
2. Plaque reduction neutralization test.
3. Virus Isolation.
4. Nucleic Acid amplification

### **Vaccine**

The Russian were the first to practice vaccination against JE. In the United States Army and resulted in the vaccination of over 250000 persons on Okinawa in 1945 and 1946 [4]. There are two strain of vaccine - (1) formalin inactivated mouse brain vaccine using - **NAKAYAMA STRAIN**. It is given as two doses at two weeks apart which is followed by a booster 6 - 12 months . (2) Live Attenuated Vaccine developed in China from JE strain **SA - 14 - 14 - 2**. It is given as two doses at 1 year apart.

### **Vaccines Licensed In India**

1. Inactivated vero cell culture derived SA 14 - 14 - 2
2. Inactivated vero cell culture derived Kolar Strain, 821564XY, JE vaccine [5]

### **Material And Methods**

#### **Study Population Source Of Data**

The study was conducted on 18 consecutive patients admitted to Rajendra Institute of Medical Sciences, Ranchi during the study period.

### **INCLUSION CRITERIA**

JE patients is diagnosed by : clinically

Blood Analysis  
Biochemical Methods  
CSF Findings

### **Exclusion Criteria**

Patients with :

1. Diabetes
2. Hypertension
3. Previous Heart Illness
4. Lung Pathology
5. Sepsis
6. Autoimmune Disease

### **Investigation**

1. Complete Blood Count
2. Liver Function Test
3. Renal Function Test
4. CSF Finding
5. Ecg

### **Design Of Study**

Observational And Hospital Based Prospective Study.

### **Period Of Study**

One year and Two month Study ( 1<sup>st</sup> July 2018 to 1<sup>st</sup> September 2019)

### **Collaborating**

Department of microbiology  
Department of pathology  
Department of Biochemistry

### **Department**

**Consent** : Individual/care takers written and informed consent

**Analysis** : Statistical Analysis was performed using appropriate tests as required according to data.

**Conflict Of Interest** : NIL

**Financial Support**: SELF

**Participants** : 18 JAPANESE ENCEPHALITIS Patients admitted in Medicine ward at Rajendra Institute of Medical Sciences Ranchi

### Observations And Result

SEX	NO. OF CASES	PERCENTAGE
MALE	17	94.44
FEMALE	1	5.55

**TABLE 1 : Distribution Of Age**

#### Comments :

About 50% Of The Study Population Were In The Group Of 21 - 40 Years. Rest Were Below Fifty Percentage . About 22.22 % , 16.66% And 11.11% Were From 41 - 60 Year , < 20 Years And > 61 Years Of Age Group Respectively.

ECG	NO. OF CASES	PERCENTAGE (%)
NORMAL	9	50
LAD	6	33.33
RAD	3	16.66

**TABLE 2 : Sex distribution In The Study Population**

**Comments** : About 94.44% Were Male And 5.55% Were Female

**TABLE 3 : Ecg Changes In The Study Population**

SERUM CREATININE(MG/DL)	NO. OF CASES	PERCENTAGE (%)
<1	9	50
1.1-2	4	22.22
>2.1	5	27.77

**Comments** : About 33.33% Had LAD , 16.66% Had RAD And 50% Cases Had Normal Ecg

**TABLE 4 : Serum Creatinine In The Study Population**

**Comments** : About 50% Of Cases Had < 1 mg/dl Serum Creatinine . About 27.77 % Of Cases Had Serum Creatinine > 2.1 mg/dl And 22.22 % Of Cases Had Serum Creatinine Between 1.1 - 2 mg/dl [ normal male : 0.6 - 1.2 mg/dl and female : 0.5 - 0.9 mg/dl ] [6]

TOTAL BILIRUBIN (MG/DL)	NO. OF CASES	PERCENTAGE (%)
0-1	11	61.11
1.1-2	6	33.33
>2.1	1	5.55

**TABLE 5 : Total Bilirubin In The Study Population**

**Comments :** About 61.11 % Were From 0 - 1 mg/dl Of Total Bilirubin Group . About 33.33 % Were From 1.1 - 2 mg/dl Of Total Bilirubin Group And 5.55 % Were From > 2.1 mg/dl Total Bilirubin Group . [ *normal total bilirubin : 0.3 - 1.3 mg/dl* ] [7]

**TABLE 6: Outcome Distribution In The Study Population**

OUTCOME	NO. OF CASES	PERCENTAGE (%)
DISCHARGE	14	77.77
DEATH	4	22.22

**Comments :** About 77.77 % Of Cases Were Discharged And 22.22 % Were Dead

**TABLE 7 : Death Vs Rft**

SERUM CREATININE MG/DL	NO. OF DEAD CASES	PERCENTAGE (%)
0-1.9	1	25
>2	3	75

**Comments :** About 75 % Of Dead Had Serum Creatinine - > 2 mg/dl

**TABLE 8: Death VS Lft**

TOTAL BILIRUBIN MG/DL	NO. OF DEAD CASES	PERCENTAGE(%)
0-1	1	25
>1	3	75

**Comments :** About 75% Of Dead Cases Had Total Bilirubin > 1 mg/dl

**TABLE 9: Death vs Ecg**

ECG	NO. OF DEAD CASES	PERCENTAGE(%)
NORMAL	0	0
LAD	4	100
RAD	0	0

**Comments :** About 100 % Of Dead Cases Had LAD Axis In Ecg

## Discussion

In total of 18 JE patients, about 50 % of the study population were in the group of 21 - 40 years. About 22.22 % of the study population were in the group of 41 - 60 years and 16.66 % in the <20 years of age group. All 18 patients came with the complain of fever, 72.22 % people were complaining of headache and 50 % cases had altered sensorium. All 18 patients were tested positive for CSF JE IgM.

About 27.77 % of cases had serum creatinine > 2.1 mg/dl. About 22.22 % cases came under 1.1 - 2 mg/dl of serum creatinine group. And about 50 % of cases had serum creatinine < 1 mg/dl. About 5.55 % of cases had total bilirubin > 2.1 mg/dl, about 33.33 % of cases had total bilirubin between 1.1 - 2 mg/dl and 61.11 % had total bilirubin < 1 mg/dl. About 33.33 % cases had LAD (Left Axis Deviation), 16.66 % cases had RAD (Right Axis Deviation) and 50 % cases were normal. Out of 18 JE patients, 14 patients were discharged and 4 were dead.

Out of 4 dead patients, 3 patients had serum creatinine > 2 mg/dl, which was about 75 % among dead.

Three dead patient had total bilirubin > 1 mg/dl which was about 75 % among dead. All 4 dead patients had Left Axis Deviation (LAD).

## Conclusion

The incidences of JE has been increased in adults in recent years. Studies to assess the cause of epidemiological shift, control of amplifying host, awareness programmes, health education and more targeted use of JE vaccination are need of the hour to reduce mortality and morbidity of JE among adults.

According to data collected in our study, we further recommend more studies on these parameters for better prognosis and outcome in the patient of Japanese Encephalitis.

## Abbreviation

1. LAD - LEFT AXIS DEVIATION
2. RAD - RIGHT AXIS DEVIATION
3. RFT - RENAL FUNCTION TEST
4. LFT - LIVER FUNCTION TEST
5. ECG - ELECTROCARDIOGRAPHY
6. JE- JAPANESE ENCEPHALITIS
7. CSF- CEREBROSPINAL FLUID

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