

Japanese Encephalitis in Children admitted at Patan Hospital

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Abstract

This is a hospital based retrospective study, which was done in Pediatric ward of Patan hospital. Study period was one and half year (from Srawan 2063 to 2064 poush). Data were taken from discharge book of Pediatric ward, from the record section of this hospital, and from JE surveillance office, WHO, Kathmandu. All children from 1 month to 14 years, who were admitted in Pediatric ward with symptoms of Meningitis, Meningoencephalitis and Encephalitis were included in this study and patients more than 14 years of age and symptoms not suggestive of meningitis, meningoencephalitis or encephalitis were excluded from the study. Headache; vomiting and fever were the chief complaints of patients. Two patients died during study period. There were 16 patients with serologically confirmed Japanese encephalitis.

Key words: Japanese encephalitis virus (JEV), arthropod borne disease, Acute encephalitis syndrome (AES).

Introduction

Japanese encephalitis virus (JEV), arthropod borne pathogen infections can be found throughout the temperate and tropical zones of Asia.² Approximately 3 billion people and 60% of the world's population live in JE-endemic regions and there are approximately, 50000 cases and 15,000 deaths per annum were notified from wide geographical range³. In endemic areas annual incidence ranges from 10-100 per 100000 populations⁴. The virus was isolated for the first time in the world from a post mortem human brain in Japan in 1933AD, although descriptive accounts of the disease date back to late 1800AD.¹ In 1954, it was shown that virus could also infect pigs, bovines, dogs and sheep.⁵ Basically, JE is a zoonotic disease maintaining JEV in nature by bird mosquito bird and pig mosquito pig cycles.⁶ Pigs are amplifiers of JEV. Bats can also carry the virus for longer period of time. Human beings are only incidental hosts forming a dead end.

A growing number of cases of Japanese Encephalitis have been seen in horses in China and humans in India, Nepal, Philippines Sri Lanka, Northern Thailand, Vietnam, and Myanmar.¹ JEV is the most common documented cause of viral encephalitis in Cambodia⁷.

Rise in population density, deforestation and increasing irrigation of agricultural areas may contribute to the rise in JE incidence each year JEV infections were occasionally found in Indonesia and Northern Australia but never found in United States.¹ In recent years, JE is rare in Japan due to JE virus vaccination, use of agricultural pesticides and controlled pig farming.^{1,8} The occurrence of JE has also been reported less in Korea, China and Taiwan due to JE virus vaccination of children.

Japanese Encephalitis (JE) known "a plague of the Orient" continues to be the most common human epidemic encephalitis in the world. About one third of the patients die and half of the survivors have residual sequelae.³ The major burden of this disease is in children. Diagnosis depends on a high degree of clinical suspicion and confirmation by serology or culture: Cerebrospinal fluid (CSF) analysis, computered tomography and magnetic resonance imaging are also important.

Most studies of the clinical features of JE have been based on information collected during epidemics and during which diagnosis was confirmed only a small number.⁹ Even during epidemics, many patients

might be suffering from other causes of acute febrile encephalopathy.¹⁰

This disease was first recorded in Nepal in 1978 as an epidemic in Rupandehi district of the western development region and Morang of the eastern region. At present this disease is endemic in 24 districts of the country. Although JE as found endemic mainly in tropical climate areas, existence and proliferation of encephalitis causing viruses in temperate and cold climates of hills and valleys are possible.¹¹ More than 50% of morbidity and 60% mortality occur in the age group below 15 years. Upsurge of cases take place after the rainy season (monsoon). Cases start to appear in the month of April-May and reach its peak during late August to early September and decline from September.¹¹

Japanese Encephalitis is demonstrated to be a significant public problem throughout Asia. It primarily affects children between the ages of one and 15 years. Of those who contract the diseases, approximately 70 % either die or are left with a long term neurological disability. JE vaccines due to various causes have not been able to meet the needs of developing country's health systems.¹²

World studies reports mortality rate due to JE ranges from 23% to 36 % and 18 % of cases end up with complications.^{13,14,15} Some studies say that infection may also result in residual sequelae in 30%-60% of cases.¹⁶ Limited data has also indicated that JE acquired during the first or second trimesters of pregnancy can cause intrauterine infection and miscarriage.¹⁸

The main objectives of this study are to study the most common symptoms of presentation of Japanese encephalitis among admitted children at Patan Hospital, the prevalence of disease in different months of year and to know the serologically confirmed cases among AES.

Method of Study

This is a hospital based retrospective study, done in Pediatric ward of Patan hospital. Ninety patients were included in this study and the study period was one and half year (from Srawan 2063 to 2064 poush i.e. July 2006 to December 2007). Data was extracted from the discharge book of Pediatric ward, record section of OPD, JE surveillance office which was then analyzed.

Inclusion criteria: All children from 1 month to 14 years, admitted in Pediatric ward with symptoms of Meningitis, Meningoencephalitis and encephalitis.

Exclusion criteria: All children more than 14 years of age, Children with symptoms not suggestive of meningitis or encephalitis.

Results

There were a total of ninety (90) Acute Encephalitis like Syndrome (AES) out of which sixteen (16) had JE confirmed by serology and culture. It was seen that JE had decreased from the year 2007 as compared to 2006. Even though a female preponderance was noted in the initial years of life, it remained equal from the age of 5 years onwards. Symptomatically fever (n=16) was the most common symptom of patients followed by vomiting (n=8) and headache (n=5). Other symptoms such as loss of consciousness, altered level of sensorium and seizures were also noted. Annual pattern of JE showed that most of the cases were observed during August and September months. Out of the total sixteen patients two died during study period the case fatality rate being 12.5%.

Fig. 1: Showing the total (AES) Patients and Laboratory Results Confirmed JE Patients.

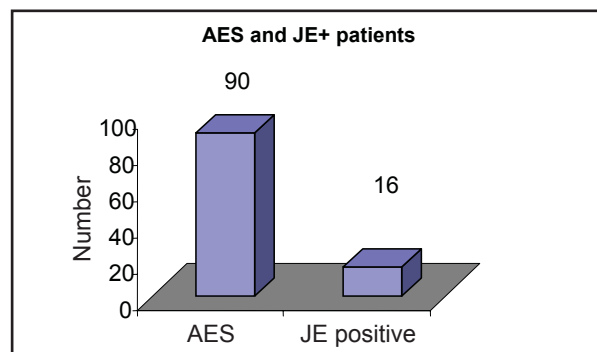


Fig 2: Showing that JE in different age years.

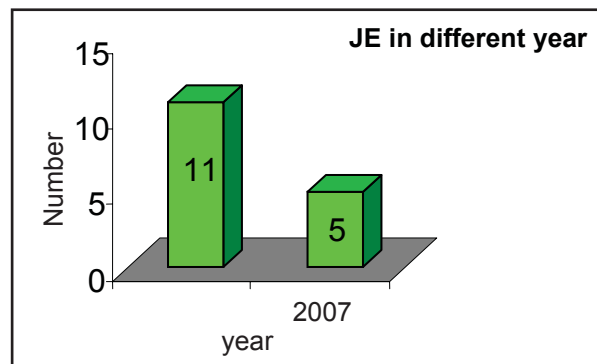


Fig. 3: Showing the Age and Sex distribution of JE patients.

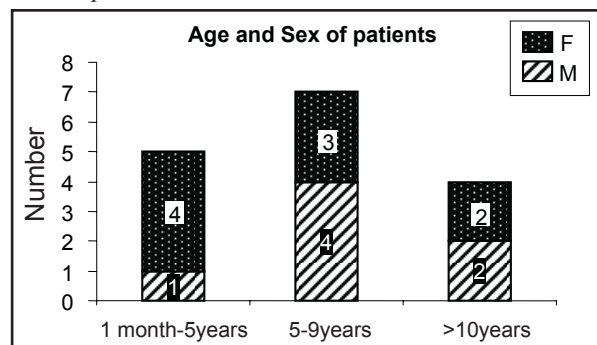


Fig. 4: Showing the various symptoms seen in patients with JE.

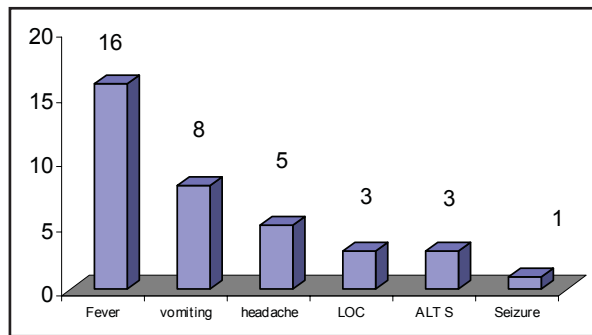
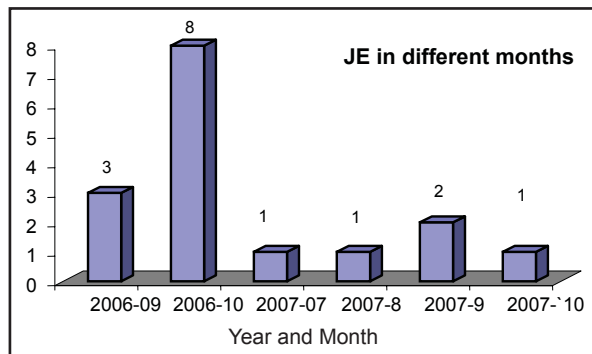


Fig. 5: Showing JE cases in different months of the year.



Discussion

Japanese encephalitis is demonstrated to be a significant public health problem in Nepal and throughout Asia. JE case is considered to have elevated temperature over 38°C along with altered consciousness and is generally confirmed serologically by findings of specific anti JE Ig M in the cerebrospinal fluid. This disease primarily affects children between the ages of one and fifteen year's .Of those who contract the disease; approximately, Seventy percent either die or are left with a long term neurological disability. JE vaccines existed for a long time, however due to cost and unstable supply; they have not been able to meet the needs of developing country health systems. As a result, sixty eight (68) percent of babies born in the poorest countries of Asia are at risk for JE. ¹⁹ The disease presents with a prodromal stage, an acute encephalitic stage with coma, convulsions and variable deficits and a convalescent stage. In view of the high mortality and severe sequelae which often leaves behind highly dependent and dependent and disabled survivors, the diseases is assuming great importance.²⁰

Japanese Encephalitis is demonstrated to be a significant public health problem throughout Asia .The geographical distribution of JE has expanded over the years to include all of Southeast Asia and most of the Indian Subcontinent. ²¹ Epidemics of JE have spread across all of Southeast Asia and were reported for the first time in Nepal in the late1978 and are now endemic in the southern lowlands, probably as a result of steady

rise in population density, deforestation and increasing irrigation of agricultural areas^{22, 23} Most infections with JE virus cause no symptoms and <0.1% develop severe Encephalitis ²⁴.

In this study serologically confirmed JE was found in 17.7% cases. Diagnosis of disease was mostly based on detection of presence of JEV-specific IgM antibodies. A. Rayamajhi et al in their study found lab confirmed JE in 86.2 % cases in one study ²¹ and 61.7% of cases in another study. ²⁵ Akiba et al had found lab confirmed JE in 78% of cases. ²⁶ Our finding was much less than that found by other authors.

This Study showed 56.25% male patients in comparison to 43.75% females. A. Rayamajhi in his study found 69 % male and 31 % females, which is about same as in our study.²¹ Study from South India also showed male to be effected in 58% cases and female sex in 42% case.³

Seventy five percent patients in this study were under nine years of age. Raghava Potula in his study found 71.2% patients less than ten years. This data is more or less similar to our study.³ A. Rayemajhi et al in their study found 58.4 % patients below nine years of age. Number of children less than nine years were more in our study as compared to the one done by Ajit et al ²¹. Neeru Gupta from India found 31.25% cases less than five years of age, more than 4/5th of the cases (84%) were between one to twelve years of age. ²⁷

Our study showed that fever was the most common symptom of JE and was found in 100 % cases, the other symptoms seen in this disease were headache (31.25%), vomiting (50.0%), seizure (6.25%), altered sensorium (18.75%) and unconsciousness (18.75%). Ajit et al in their study found Headache in 54.2% cases, vomiting in 50% cases and seizures in 58 % cases following symptoms.²¹ Neeru Gupta et al found fever in 100% cases, vomiting in 41.4%, headache 10.3% cases and convulsions in 51.7% cases.²⁷ Findings of our study are similar with findings of other authors..

Present study showed most of the cases appeared soon after Monsoon, i.e. during August and September months. Eight seven point sixty percent cases were seen during these two months. Study done by Bista B.M showed, upsurge of cases take place after the rainy season (monsoon). According to his study, cases start to appear in the month of April-May and reach its peak during late August to early September and start to decline from October.¹¹ One study from India gives similar report as have maximum no of patients with Encephalitis during the month of July., August and September²⁷. So findings of our study go along with other's findings in relation to upsurge of disease.

During the eighteen months of study, two patients died, hence the mortality rate being 12.5%. Study done

at BP Koirala Institute of Health Sciences showed 8.3 % mortality rate²⁵ and report from Indonesia showed, Case fatality rate of 10 %.²⁸ Similarly Akiba T and Kumar R in their studies found case fatality rate of 13.2%²⁶ and 20-50% simultaneously.²⁹ All these findings are similar to our findings. Besides these, our results are consistent with previous studies done in Nepal and the Philippines. Studies from India and Thailand found JE to account for a higher proportion of deaths.

Conclusion

Japanese encephalitis is a serious public health problem with significant mortality in children. Female patients suffered more than males during early ages of life. Fevers, headache, vomiting and altered sensorium were common symptoms of the diseases. Most cases were seen during summer season (August to October). Case fatality rate was eleven percent. Serological test is confirmative.

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