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Original Research Article

A retrospective study on the seasonal occurrence of Japanese Encephalitis cases in Uttar Pradesh

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ABSTRACT

Background: Japanese encephalitis (JE) is a dreaded mosquito-borne viral disease, especially in Asian, Western Pacific, and Northern Australia region and a major public health problem in India. In India, State of Uttar Pradesh contributed a large portion of JE cases to the country. Because of its high morbidity and mortality, JE is of particular interest. With the help of specific intervention, we can prevent the morbidity and mortality of JE cases. The objective of the study was to know the seasonal occurrence of JE cases in Uttar Pradesh.
Methods: This was a retrospective study based on secondary data, shared by Communicable Disease wing of Swasthya Bhawan, Lucknow, Uttar Pradesh (U.P) for the analysis. We used data for the study during the past 7 years (2010–2016). Analysis has been done using Microsoft Excel.
Results: In Uttar Pradesh, there were 1322 cases of JE during the year 2010-2016. Peak incidence of JE cases were seen in months of September. An overall decreasing trend with some fluctuation was seen in the occurrence of cases from 2010 to 2016. It was also observed that maximum cases were occurred in monsoon season. Majority of the cases were seen in Gorakhpur district which is located in eastern part of Uttar Pradesh.
Conclusions: Majority of the cases of JE were seen in rainy months. Gorakhpur district of Uttar Pradesh has the highest load of JE cases. IEC activities should be carried out to disseminate the information regarding JE among the people for prevention.

Keywords: Communicable disease, Japanese encephalitis, Mosquito-borne disease

INTRODUCTION

Japanese encephalitis (JE) is caused by a Group B Arbovirus (Flavivirus). Culicine mosquitoes are the main vector of this disease. Its zoonotic disease infecting mainly animals but can affects humans also. Majority of the cases occur among children <15 years of age. Transmission occurs in agricultural areas, where flooding irrigation is practiced.[1]

Japanese encephalitis is so called because for the first time severe epidemic of encephalitis occurred in Japan during 1924 and then epidemics occurred almost annually thereafter till 1970. Since then it has been declining in Japan but started in almost all SE Asian countries. JE is common in SE Asian countries including India and rare in other parts of the world. Globally about 43,000 cases of JE occur each year with 11,000 deaths and 9000 disabled. Fatality rate ranges from 20–40%.[2] Nearly 3 billion people or close to half the global population live in Japanese encephalitis endemic regions.[3]

First case was reported in 1955 in Tamil Nadu and the disease was restricted to South India. Spread started to North India in 1978 from where extensive and recurrent

outbreaks of JE have been reported ever since.4 In India, State of UP contributed a large portion of JE cases to the country.[5]

JE is of particular interest as it has a high morbidity and mortality affecting both pediatric and adult age group. Neurologic or psychiatric components observed in 30–50% of survivors.[6] Neurological sequalae is the most dreaded damage caused by JE. Understanding of seasonal occurrence of JE cases in Uttar Pradesh is extremely important to manage the encephalitis cases individually and to contain the epidemic in the community.

METHODS

The present retrospective study was conducted in the state of Uttar Pradesh, which is the most populous state of the country. It consist of 75 districts that has been clustered into 18 administrative divisions.[6] For the study, we used secondary data, shared by Communicable Disease wing of Swasthya Bhawan, Lucknow, Uttar Pradesh (U.P), a government institution, for the analysis and prior permission was taken for the same.

We used data for the study during the past 7 years (2010–2016). To assess the seasonal occurrence of the JE cases, the year can be broadly divided into three seasons: summer (March to May), monsoon (June to September) and winter (October to February).[7] Data was arranged and analyzed for the following variables like month-wise case occurrence, annual incidence and seasonal occurrence. Analysis has been done using Microsoft Excel.

RESULTS

In the present study, we used data of JE cases from 2010 to 2016 for analysis. In the last 7 years (2010-2016), total cases of JE in Uttar Pradesh were 1322 (Table 1). On classifying the JE cases according to their month of occurrence, majority of the cases were found in months of September (31.77%) followed by October (24.74%) and August (24.05%) (Table 1).

Table 1: Month-wise distribution of JE cases (2010-2016).

Months	Years							
	2010	2011	2012	2013	2014	2015	2016	Total (%)
Jan	0	6	1	0	0	0	0	7 (0.53)
Feb	1	13	0	0	0	0	0	14 (1.06)
Mar	0	2	0	0	0	4	0	6 (0.45)
Apr	1	1	0	0	0	1	0	3 (0.23)
May	2	1	0	0	0	1	4	8 (0.61)
Jun	4	3	0	0	0	5	0	12 (0.91)
Jul	29	11	17	7	15	6	10	95 (7.19)
Aug	85	48	40	46	31	31	37	318 (24.05)
Sep	122	63	53	47	28	50	57	420 (31.77)
Oct	123	46	19	41	17	23	58	327 (24.74)
Nov	40	12	3	9	10	4	9	87 (6.58)
Dec	10	3	0	4	0	4	4	25 (1.89)
Total	417	209	133	154	101	129	179	1322 (100)

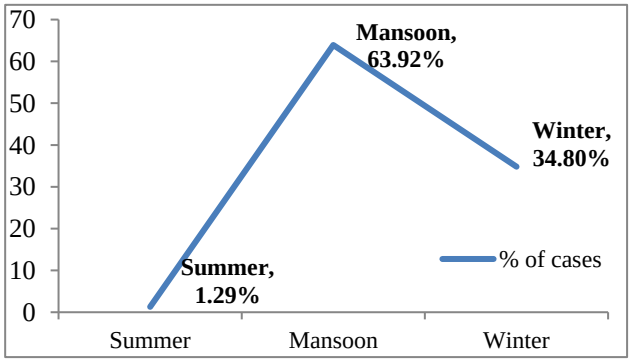

Figure 1: Seasonal occurrence of the JE cases.

On arranging the JE cases according to the season, it was observed that maximum cases (63.92%) occurred in monsoon (rainy) season starting from the month of June to September followed by winter season (34.80%) (Figure 1). Cases were at peak in rainy season as compare to summer months. Very few cases were seen in summer season.

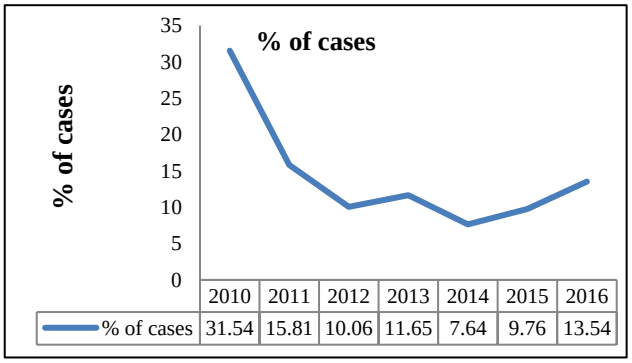

Figure 2: Yearly occurrence of the JE case.

On considering the yearly occurrence of the cases from 2010 to 2016, it was also observed that there was a annual fluctuation in the occurrence of JE cases with overall decreasing trend with an exception of year 2016 (Figure 2). Out of total cases in the last 7 years, maximum percentage of cases were seen in 2010 (31.54%) and minimum in 2014 (7.64%) (Figure 2).

Among the U.P. districts, most cases were seen in Gorakhpur (25.18%) followed by Kushinagar (24.35%) and Deoria (13.58%). In geographical distribution of JE cases majority of the cases were found in the eastern part of Uttar Pradesh.

DISCUSSION

In the present study, total cases of JE in Uttar Pradesh were 1322 in the last 7 years (2010-2016). On classifying the JE cases according to their month of occurrence, majority of the cases were found in months of September (31.77%). Similar findings have been reported by other authors while in study conducted by Sarkar et al at Assam, peak of JE incidence occurred in the month of July.[6-8] On arranging the JE cases according to the season, it was observed that maximum cases (63.92%) were observed in rainy season starting from the month of June to September which coincides with paddy cultivation and the period of peak mosquito density. This finding is similar to the observations made by Kanojia et al and Sarkar et al.[7,8]

On considering the yearly occurrence of the cases from 2010 to 2016, it was also observed that there was an overall decreasing trend in the yearly occurrence of the case with some fluctuations. These findings are consistent with other studies by different researcher.[6] This may be because of the improvement in the health care services in the state.

In our study, majority of the cases were found in Gorakhpur (25.18%) district of Uttar Pradesh (U.P) followed by Kushinagar (24.35%). Floods, water logging and formation of shallow ponds are annual features in the region. Paddy is cultivated in monsoon in this region with flooding irrigation being practiced. This also provides an optimal breeding ground for culex mosquitoes. Similar results were seen in the study conducted by Singh et al in Uttar Pradesh.[6]

CONCLUSION

JE is a major public health problem prevalent in eastern part of Uttar Pradesh. There is a need of appropriate public health intervention by the policy makers to control this dreaded disease of mankind. Better treatment facilities are needed for better outcome. Information, education and communication (IEC) strategies, planning and their effective implementation has always been the mainstay of prevention. Hence adequate and specific information should be disseminated to the people regarding the determinants and factors of JE occurrence and its prevention. With the availability of a safe and effective vaccine, vaccination can play a major role to control JE.

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