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TRENDS AND STATUS OF JE IN BIHAR SINCE 2015-2018

Microbiology

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ABSTRACT

Abstract:-Japanese Encephalitis (JE) is a mosquito borne viral infection, a major paediatric problem and is vaccine preventable encephalitis. Although various studies have been conducted on trends of JE, it is the intense need to study the trends and status of Acute Encephalitis Syndrome (AES) and JE in Bihar which lacks in data but not in the illness.

This study was conducted over the period of four years, since January 2015 to December 2018, to understand the trends and status of the disease in Bihar. The data were collected from patients coming to Patna Medical College & Hospital, Patna, Bihar.

The study is evident that there is similarity in the number of suspected AES cases as well as positive JE cases in the entire study of four years duration. There is high similarity in the seasonal pattern of suspected AES cases as well as positive JE cases.

KEYWORDS

JE, AES, Trends

INTRODUCTION:-

According to the definition of WHO (World Health Organization), 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, AND/OR new onset of seizures (excluding simple febrile seizures). In India epidemics of Japanese Encephalitis (JE) are reported in many parts of the country, and it is considered a major paediatric problem.[1]. It is a vector borne viral disease caused by JE virus which belongs to the family *Flaviviridae* and is transmitted to human by Culex mosquitoes. Transmission is variable, and is coupled with environmental temperature. During winter mosquitoes are inactive, but huge epidemics can happen during summer and autumn. JE is the leading cause of vaccine- preventable encephalitis which affects Central Nervous System (CNS), and can cause serious complications and even death.

In India, the first JE cases was reported from Vellore district of Tamil Nadu in the year 1955 and in 1973 the first major outbreak was reported from Burdwan district of West Bengal. Since then a series of outbreaks are reported in different parts of the country. The 2005 and 2006 epidemics of Utter Pradesh surpassed all the previous reported outbreaks in the country. Bihar has also reported a rise in the number of patients with AES and JE with periodic epidemics in various districts. Apart from all reported epidemics, there is high possibility of many unreported cases and hence the actual status and burden of the disease must be considerably higher, both in India and entire world. These various outbreaks led to the introduction of the JE vaccine in endemic areas and development of surveillance guidelines for AES and JE by the National Vector Borne Disease Control Programme (NVBDCP).

MATERIALAND METHOD :-

We aimed to know the status and trends of AES and JE cases in Bihar. For this, we studied and analysed the yearly data of the suspected AES and confirmed JE cases since January 2015 to December 2018, for the duration of four years. The collected samples of the patients suspected for AES cases in various departments of Patna Medical College & Hospital and from other places underwent serological and demographic investigation in the virology lab of Department of Microbiology, Patna Medical College, Patna, Bihar. Specimen collection, transport and processing of the samples were strictly monitored. Patients coming to any department of PMCH or any other hospitals referral patients suffering from symptoms such as fever, headache, seizures, neck/body rigidity, irritability, increased somnolence, altered sensorium, change in mental status, coma, flaccid paralysis or other symptoms if any, were taken as the subject of study. A detail Case Report Form (CRF) was filled with the help of patient's attendant very carefully. IgM Antibody Captured Enzyme Linked Immunosorbent Assay (MAC ELISA) was performed on the collected samples that is serum as well as CSF (Cerebrospinal Fluid) samples against Japanese Encephalitis virus. The MAC ELISA kits were supplied by the National Institute of Virology, Pune and the testing of the samples were done strictly following the manufacturer's protocol. Data so obtained were analysed very carefully and arranged according to the year wise, district wise, month wise, age-group wise, according to the inhabitation of the patients and male- female ratio wise in their numbers and percentage in charts and are also represented in figures and graphs.

RESULT :-

The trend of suspected AES cases and the confirm JE cases has been found more or less similar in the four year study. Table 1 shows the suspected AES cases, total positive, negative cases and total number of male and female cases in the year 2015, 2016, 2017 & 2018 respectively. We can see, in the year 2015, 2016,2017 and 2018 the total number of cases were 443, 423, 360,and 395 respectively whereas the total positive JE cases were 36 (8.1%), 47 (11.1%), 42 (11.6%). and 42 (10.63%) respectively. We found that there is similarity in the pattern of illness in the entire four years study. In regard to male and female, we c observe that the number of male were 22 (61.11%), 24 (51.06%), 25 (59.52%) and 27 (64.2%)and total number of female were 14 (38%), 23 (48.93%) , 17 (40.47%) and 15 (35.7%) cases in the year 2015, 2016, 2017 & 2018 respectively. Table 2 shows the month wise distribution and the comparative account of the cases for the four year duration. Here we can see similar pattern in all the four years. It is evident that JE tends to be sporadic throughout the year, with a peak after the rainy season that is in the month of September and October which is the monsoon and just after the monsoon season in Bihar for all the four years of our study. Table 3 shows the comparative account of patients on the basis of their age-group. Here we can see that children of age group 1 to 15 years of age are more susceptible for the disease. Rate of infection in 0 to 15 years of age was average and approximately 09 to 10 times higher than in older individuals, because of the developed herd immunity in older individuals. Table 4 shows the comparative account of data according to inhabitation of patients that is rural and urban distribution of patients in the year 2015, 2016, 2017 & 2018 respectively. Here we can see that rural population are more affected in comparison to the urban population because of higher exposure to mosquitoes in rural population in comparison to urban population. By studying all data we can analyse the trends and status of the disease in the state Bihar.

Table-1 :-Suspected AES cases ,total positive, negative, positive male and positive female in the year 2015,2016, 2017 & 2018.

Year	Total Case	Total Positive	Total Negative	Total Male	Total Female
2015	443	36 (8.1%)	407 (91.9%)	22 (61.11%)	14 (38%)
2016	423	47 (11.1%)	376 (88.9%)	24 (51.06%)	23 (48.93%)
2017	360	42 (11.6%)	318 (88.4%)	25 (59.52%)	17 (40.47%)
2018	395	42 (10.6%)	353 (89.3%)	27 (64.2%)	15 (35.7%)

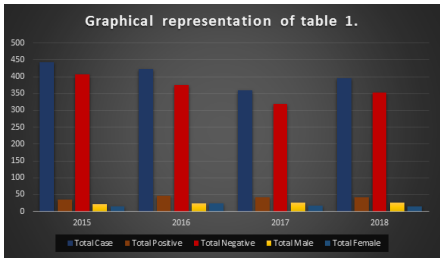


Table 2 :-Month wise distribution of JE positive cases in year 2015, 2016, 2017 & 2018.

Month	2015	2016	2017	2018
January	00 (0%)	00 (0%)	00 (0%)	00 (0%)
February	00 (0%)	00 (0%)	01 (2.3%)	00 (0%)
March	00 (0%)	00 (0%)	01 (2.3%)	00 (0%)
April	00 (0%)	02 (4.2%)	01 (2.3%)	00 (0%)
May	00 (0%)	01 (2.1%)	02 (4.7%)	00 (0%)
June	00 (0%)	01 (2.1%)	01 (2.3%)	00 (0%)
July	00 (%)	04 (8.5%)	01 (2.3%)	03 (7.1%)
August	04 (11.1%)	05 (10.6%)	06 (14.2%)	02 (4.7%)
September	15 (41.6%)	11 (23.4%)	11 (26.1%)	06 (14.2%)
October	14 (38.8%)	11(23.4%)	10 (23.8%)	15 (35.7%)
November	02 (5.5%)	09 (19.1%)	07 (16.6%)	08 (19.0%)
December	01 (2.7%)	03 (6.3%)	01 (2.3%)	08 (19.0%)

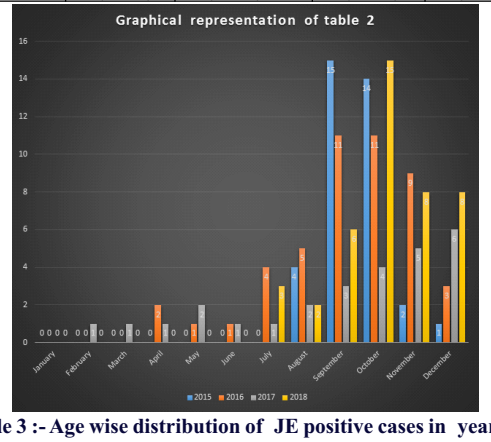


Table 3 :- Age wise distribution of JE positive cases in year 2015, 2016, 2017 & 2018.

Year	0-5 Year	5-10 Year	10-15 Year	15-20 Year	>20 Years
2015	12 (33.33%)	17 (47.22%)	03 (8.3%)	02 (5.5%)	02 (5.5%)
2016	16 (34%)	15 (31.9%)	14 (29.7%)	01 (2.1%)	01 (2.1%)
2017	15 (35.7%)	14 (33.3%)	08 (19%)	02 (4.7%)	03 (7.1%)
2018	12 (28.5%)	17 (40.4%)	10 (23.8%)	00 (0%)	03 (7.1%)

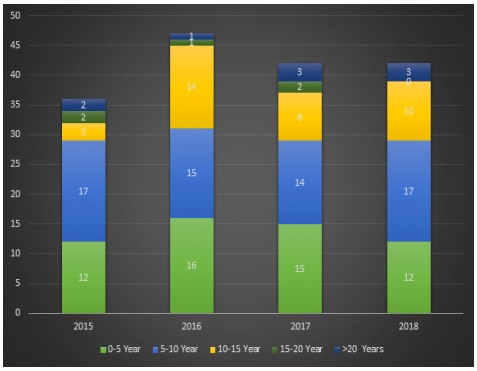
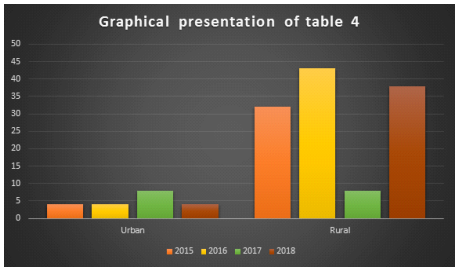


Table 4 :- Urban & Rural distribution of JE positive cases in year 2015, 2016, 2017 & 2018.

Area Wise	2015	2016	2017	2018
Urban	04 (11.1%)	04 (8.5%)	08 (19%)	04 (9.5%)
Rural	32 (88.8%)	43 (89.3%)	34 (81%)	38 (90.4%)



DISCUSSION:-

Now a days when people are more concern about their health, mainly concern about their children for their vaccination, various preventive measures and treatment, this study will help in understanding the outcome of the awareness. Though there is no cure for the disease, treatment is focussed on relieving severe clinical signs and supporting the patient to overcome the infection. Safe and effective vaccines are available to prevent JE. WHO recommends that JE vaccination be integrated into national immunization schedules in all areas where JE disease is recognized as public health issue. [2] .After a series of outbreaks of the disease, various vaccines came into emergence and the public as well as government become more cautious about the immunization programme and timely vaccination by incorporating the JE vaccine in the routine immunization list. Proper cold chain should be maintained for vaccines to be used for immunization of children. Active vaccination campaigning should be done to cover maximum children. Because of very high density of mosquito, only vector control cannot be relied upon to prevent JE. Thermal fogging, use of larvicides, intermittent irrigation and constant flow system should be implement. [1]. JE burden can be estimated satisfactorily to some extent by strengthening diagnostic facilities for JE confirmation in hospitals and by maintenance of contact with the nearby referral hospitals to collect the particulars on JE cases. It is essential to immunize the pigs (amplifying host) also to interrupt the transmission of the diseases. [3].Our study also indicates that most of the JE cases occurred in the rural districts of Bihar, where the main occupation is farming. JE is mainly prevalent in children and adolescents below 20 years of age with no gender predilection.[4]. In our study we also got the same result. Though there are a number of studies have been done and a large numbers of data is available regarding this study but there is lack of data from the state Bihar regardless of the illness present in the state. This study will be very helpful in realizing the seriousness of the problem so that various preventive steps could be taken. After the series of outbreaks in the year 2005 and 2006 in Utter Pradesh, various studies has been done and reported from various part of the country but the state Bihar was lacking in producing the actual burden of the disease in its different areas. As we have seen the disease takes its peak in monsoon or post monsoon season, preventive measures should be taken to prevent the disease from spreading.

CONCLUSION :-

This study will help to assess the seasonal pattern, trends and status of the illness in our state and in turn, our country to slow down the burden of JE. Sporadic JE should be taken into consideration to analyse the actual JE burden and to take preventive steps to minimize its consequences.

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