ORIGINAL RESEARCH PAPER

Volume-7 | Issue-8 | August-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

STUDY OF DEMOGRAPHIC PROFILE OF JAPANESE ENCEPHALITIS IN BIHAR: - A STUDY FROM PATNA MEDICAL COLLEGE AND HOSPITAL, PATNA, BIHAR.

Microbiology

Ajeya Singh Research Scholar – Department of Biotechnology,M.U Bodhgaya

Vijay Kumar* Associate Professor- Department of Microbiology , Patna Medical College, Patna
*Corresponding Author

Sudhir Kumar HOD,Botany- SMD College,Punpun,Patna

Guddu Kumar Research Assistant - Department of Paediatrics , Patna Medical College, Patna

Devraj Roy Research Scientist - Department of Microbiology , Patna Medical College, Patna

ABSTRACT

Japanese Encephalitis is a mosquito borne viral infection and is leading cause of childhood encephalitis. Growth of population, paddy farming, pig rearing, lack of surveillance, awareness and vaccination, compromised immune system are the key factors for the transmission of the disease. Although various studies have been conducted on epidemiology of JE. Still the need for further research to have a much clear understanding of the disease and its relation with various factors like demographic profile, age, sex, geographical distribution, seasonal effects, etc. is needed.

This descriptive study was conducted over collected samples in the Department of Microbiology, PMCH, Patna, Bihar. Confirmation of JE was done by IgM ELISA method. Data so obtained were arranged accordingly in percentage or numbers as required.

Children of age group 0 to 15 years were more susceptible, rural population was more vulnerable, and post rainy season shows peak for JE infection. Many of the patients discharged with some disability.

KEYWORDS

Bihar, Japanese Encephalitis, Viral Infection.

Introduction :-

Japanese Encephalitis is a mosquito borne arboviral infection caused by *Flavivirus* and is one of the most common cause of acute encephalitis syndrome in many states of India. The vectors were found throughout the year with highest peak in monsoon and post-monsoon period. Temperature and humidity are known as primary drivers for mosquito occurrence. [1]. Children are the most common victims, and most adults in endemic areas are already immune. However JE can occur at any age. Treatment is supportive, with pain relievers, antipyretics, fluids and rest. Survivors may be unable to speak, suffer recurrent seizures, be paralyzed or be impaired intellectually or behaviorally. [2]. To prevent JE, it is necessary to implement a large-scale immunization of susceptible human population. Vaccination provides active immunity against JEV. [3]. Our study was designed to do the demographic profile of Japanese encephalitis in Bihar, so that we can find out its prevalence and consequences of various factors on the disease.

Material & Methods:-

Blood and/or CSF samples collected at Pediatric/Medicine Department or any other places were referred to the virology laboratory at Patna Medical College & Hospital, Patna for 361 clinically diagnosed cases of acute encephalitis syndrome during the period from January 2017 to December 2017. Specimen collection and transportation of samples were strictly monitored. Patients complaining any or few symptoms like fever, headache, irritability, new onset of seizures, neck/body rigidity, increased somnolence, altered sensorium, change in mental status and other symptoms if any, were included in the study. A Case Report Form (CRF) was filled with the help of patient's attendant properly (which included basic details of the patients and clinical symptoms which they are suffering from) and a concerned signature were taken. IgM Antibody Captured (MAC) ELISA was performed on the CSF and serum samples by JE Virus MAC ELISA kit supplied by the National Institute of Virology, Pune. The samples were tested strictly following the manufacturer's protocol. Data so obtained were arranged and analyzed according to district wise, month wise, age-group wise, male-female ratio, inhabitation and the outcome of patients after treatment and expressed as numbers and their percentage in charts.

Result :-

The prevalence of Japanese encephalitis among acute encephalitis syndrome cases were found more or less throughout the state. But Patna and nearby district showed higher number of patients contributing AES cases because of easy approach to PMCH. Table-1 shows the district wise distribution of total AES cases and percentage of JE positive cases throughout the state and nearby places. It was found that Patna district showed maximum number of suspected as well as positive JE cases (11.9%) followed by Sitamarhi (9.5%) and Each Champaran (9.5%) followed by West Champaran (7.1%) and so on. Table-2 shows the demographic profile of suspected AES cases which includes parameters such as total number of cases with positive and negative, inhabitation, sex, and age group. Out of 360 cases, 42 (11.6%) were found positive and rest 318 (88.4%) were found negative. Out of 42 positive cases, 25 (59.52%) were male while 17 (40.47%) were female. Out of 42 patients, 36(81%) patients was from rural area while only 08(19%) patients was from urban area. It was observed that rural area was more vulnerable than urban area. We found that out of 42 positive patients 15 (35.7%) patients was from age group 0 to 5 years, 14 (33.3%) patients was from age group 5 to 10 years of age, 8 (19%) patients was from age group 10 to 15 years of age, 2 (4.7%) patients was from 15 to 20 years of age while 3 (7.1%) was from more than 20 years of age group. Children of age group 0 to 15 years shows more contributions in JE positivity but it can be seen in any age-group. Table-3 shows month wise distribution of total JE suspected and total JE positive patients. We found that JE infection starts rising in the month of August that is post monsoon season and shows its peak in the month of September and October. Again from the month of November JE activity starts falling down and till July it shows little JE activity. Table-4 shows patients totally recovered, recovered with some disability, leave against medical advice, referred to other places, or died. Our studies shows that out of 200 patients we followed 76 (38%) patients were fully recovered, 38 (19%) patients were recovered with some disability, 58 (29%) patients left against medical advice, 11 (5.5%) patients referred to other hospitals whereas 17 (8.5%) patients died.

Table 1 :- District wise distribution of JE patients in Bihar.

S.N	District	Positivity in percentage
1	Darbhanga	2.3%
2	East Champaran	9.5%
3	Gaya	2.3%
4	Jamui	2.3%
5	Jahanabad	2.3%
6	Katihar	2.3%
7	Kisanganj	2.3%
8	Madhepura	2.3%
9	Madhubani	2.3%
10	Munger	4.7%
11	Muzaffarpur	2.3%
12	Nalanda	4.7%
13	Nawada	2.3%
14	Patna	11.9%

15	Purnea	2.3%
16	Rohtas	4.7%
17	Samastipur	4.7%
18	Saran	4.7%
19	Sheikhpura	2.3%
20	Sitamarhi	9.5%
21	Siwan	4.8%
22	Vaishali	2.3%
23	West Champaran	7.1%
24	Near by States	2.3%

Table 2 :- Demographic profile of suspected AES cases.

Demographic Profile	Parameters	No. of Patients	Percentage (%)
No. of Cases	Positive	42	11.6%
	Negative	318	88.4%
	Total Cases	360	
Sex	Male Positive	25	59.52%
	Female Positive	17	40.47%
	Total Positive	42	
Inhabitation	Rural	34	81%
	Urban	08	19%
	Total	42	
Age- Group	0-5 Years	15	35.7%
	5-10 Years	14	33.3%
	10-15 Years	08	19%
	15-20 Years	02	4.7%
	20+ Years	03	7.1%

Table 3 :- Month wise distribution of total JE positive patients.

Month	2017
January	0%
February	2.3%
March	2.3%
April	2.3%
May	4.7%
June	2.3%
July	2.3%
August	14.2%
September	26.1%
October	23.8%
November	16.6%
December	2.3%

Table 4 :- Outcome of patients after treatment.

Total patients followed	200
Patients totally recovered	76 (38%)
Recovered with some disability	38 (19%)
Leave Against Medical Advice (LAMA)	58 (29%)
Referred to other places	11 (5.5%)
Died	17 (8.5%)

Discussion:-

Japanese encephalitis viral infection was found to be widely prevalent compared to other arbovirus infections. The infection is mosquito borne and human gets infected when bitten by an infected mosquito. The disease is predominantly found in rural and per urban settings. From the socio-ecological viewpoint, an outbreak of JE may be facilitated by two factors that is global climate change and the modulation of agriculture (such as adoption of paddy cultivation, use of pesticides and creation of modern pig farms). [4]. Our studies, also revealed that rural areas are more vulnerable than urban areas. It might be because of the lack of awareness of immunization against JE, unhyginicity, rice farming, mal-nutritional children and poor development of immune system which results in disease susceptibility. According to World Health Organization (WHO), annually there are about 67,900 global cases of JE, of which 20%-50% of survivors have significant neurological sequel such as paralysis, recurrent seizures or the inability to speak. In case of human infection, the virus rapidly infects the Central Nervous System (CNS), resulting in severe neuron inflammation and ultimately neuronal death. [5,6]. In our studies, we also found that out of 200 patients we followed 19 % of patients discharged with some disability like mental disability, unable to speak, flaccid paralysis, lower limb paralysis or hemiplegia, etc. 38% recovered fully and discharged, 29% left against medical advice, and 8.5% died. The study found that the disease were worst hit either in pre or post monsoon season. [7, 8]. The risk of becoming infected with Japanese encephalitis is highest during and just after rainy season. This is because mosquito populations tend to increase suddenly around this season. [11]. Our study also revealed that the post monsoon season is the peak time for JE infection. The month of September and October shows maximum number of JE suspected cases as well as maximum number of JE positive cases. JE is primarily a disease of children however all age groups are affected. Most cases occur in children under 14 years. [8, 9]. Our study also revealed that children of age-group 0-15 years are most vulnerable but it can be seen more or less in all age group. We also concluded that prevalence of JE cases was found more or less throughout the state. But Patna and nearby districts showed higher number of patients contributing JE because of easy approach to PMCH. While taking the oral case detail of patients and patient's attendant, we also concluded that patients of low socio-demographic group are more affected. One possible reason behind this might be because, Patna Medical College and Hospital is overloaded with patients, so the high socio-economic group who can afford private hospitals migrated to or referred to other private or corporate hospitals (5.5% cases in our studies) for better attention and care of the patients. 29% of patients left against medical advice which might be because of lack of monitory support, lack of proper infrastructure and care and for better monitoring and treatment of patients. While existing environmental, climatic and socio-economic factors contribute to the risk, the impact can be worse with weak health system, inadequate resources and response mechanism. [10]. So, to minimize the illness, a strong surveillance system along with implementation of high quality vaccination program for children should be implemented.

Conclusion:-

Realizing the seriousness of problem of AES and JE in Bihar, preventive measures should be taken to minimize its consequences. It can be done by several intervention measures, including early diagnosis, prompt treatment, national immunization and effective vector control program for the disease and proper immunization against it, early case detection and referrals to competent hospitals if needed, improvement in nutrition and rehabilitation of disabled children due to AES/JE to minimize its effect and morbidity rate.

Acknowledgement:-

The author express their heartfelt gratitude and sincere thanks to Dr. S.N. Singh, Professor and HOD, Department of Microbiology, Dr. A.K. Jaiswal , HOD Department of Pediatrician, and all staffs of Virology unit, Department of Microbiology, Patna Medical College & Hospital, Patna, Bihar.

References

[1]. Pantawane PB, Dhanze H, Verma MR, Singh G, Kapadi A, Chauhan J, Bhilegaonkar KN, Seasonal occurrence of Japanese encephalitis vectors in Bareilly district, Uttar Pradesh, India. J Vector Borne Dis. 2017;54:270-6.
[2]. T.Liji, What is Japanese Encephalitis? Japanese Encephalitis News, Research- News Medical. http ://www.news-medical.net.
[3]. Tiwari S Dhole N.T. Japanese encephalitis; a review of the Indian perspective; The Brazilian Journal of Infectious Diseases, Vol.16, Issue 6; pages 503-512.
[4]. S.M. HSU. A.M.F. YEN, and T.H.H.CHEN, The impact of Climate on Japanese encephalitis ; Epidemiol Infect. 2008 Jul; 136 (7): 980-987.
[5]. Basu A and Dutta K., Recent advances in Japanese encephalitis, Additional article information, version 1. F1000 Res.2017; 259. Doi: 10.12688/f 1000 research. 9561.1, PMCID ; PMC5357037, PMID ; 28357054.
[6]. Fact sheets; Japanese Encephalitis, World Health Organization, Available from http:// www.who.int/mediacentre /factsheets/ fs 386/en.
[7]. High incidence of encephalitis observed in Bihar study- DNA, India.
[8]. Malhotra S., Sharma S and Hans C (2015) Japanese Encephalitis and its Epidemiology. Japanese Encephalitis and its Epidemiology. J Infect Dis Ther 3: 243. Doi : 10.4172/2332-0877.
[9]. Hsu L-c, Chen Y-J, Hsu F-K, Huang J-H, Chang C-M, Chou P, et al.(2014). The incidence of Japanese Encephalitis in Taiwan- A Population Based Study. PloS Negl Trop Dis 8(7) :e3030 doi;10.1371/journal.pntd.0003030.
[10]. Narain J.P., Dhariwal A.C. and MacIntyre C.R., Acute encephalitis in India : An unfolding tragedy.
[11]. Japanese encephalitis- Causes – NHS.UK, http://www.nhs.uk.