

FOLLOWING VACCINATION, JAPANESE ENCEPHALITIS (JE) CIRCUMSTANCES IN LAKHIMPUR, ASSAM

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ABSTRACT

Background: Assam is positioned as the most vulnerable state for Japanese encephalitis (JE) infection. It contributes more than 51% of total JE positive cases reported in the country during the year 2014. A study was carried out in Lakhimpur district of Assam to observe the incidence of AES/JE after vaccination.

Methods: During January to December 2014, a total of 96 numbers of acute encephalitis cases (AES) were reported from Lakhimpur district of Assam. Of which, 27.08% (26/96) cases were found in the below 15 years age group. Blood samples were collected from AES patients and enzyme linked immunosorbent assay method was done for detection of JE IgM antibody.

Results: The positivity rate for Japanese encephalitis was 22.92%. Initial case of AES was reported on 4th January; however the first JE positive case was detected in 1st July. All age group has been affected; children below 15 years of age groups (13/22) are mostly vulnerable to JE infection. Males are mostly susceptible for AES/JE infection. Maximum 58 numbers of AES cases were reported during the month of July. However, except two, all other JE positive cases were also observed in the month of July. High incidence of AES/JE cases was observed from Boginodi and Nowboicha area. A total of 7 patients expired due to AES/JE, of which 3 cases were JE IgM positive. High positivity rate for JE was observed in Dhalpur and Dhakuakhana area. Maximum case fatality rate for JE was also noticed in Dhalpur and Bihpuria area. All the AES/JE death cases were unvaccinated as they were not present in their locality during the JE vaccination period. However, 36.36% (8/22) JE vaccinated cases were shown JE IgM positive.

Conclusion: High incidence of AES/JE cases occurs due to the presence of large number of domestic pigs, flooding of paddy fields etc.

Keywords: Acute encephalitis syndrome, Japanese encephalitis & Lakhimpur

INTRODUCTION

Due to the high incidence of Japanese encephalitis (JE) cases in Assam, Government has planned for adult vaccination against JE in mostly affected areas during February, 2014. In this schedule, JE affected nine districts in Assam were selected and decided to administer the vaccine among the entire population. The areas covered under this schedule were Kamrup (Dimoria development block and Chandrapur development block), Sivasagar, Golaghat, Jorhat, Dibrugarh, Tinsukia, Dhemaji and Lakhimpur district of Assam. Following vaccination, to perceive the scenario of JE incidence a study was undertaken in Lakhimpur district of Assam. The study was carried out in Lakhimpur district of Assam because, it is one of the districts in Assam, North east India where the first case of Acute encephalitis syndrome (AES) was noticed 36 years ago in Gogamukh areas. Beside this Lakhimpur district is a place where the people are suffering with many water, air and vector borne diseases [1-10]. It is also known as one of the mostly flood affected areas of Assam. During rainy season, due to the flooding of paddy fields, people were suffering from various illnesses. So, the district of Lakhimpur is considered as a focus area for study. The study describes the incidence of JE after vaccination. The study also gives a knowledge regarding the outcome of JE vaccination, risk factors and suggesting for future control measures.

Materials and methods

The study was conducted during the period from January 2014 to December, 2014 in Lakhimpur district of Assam. Any patient's clinical sign and symptoms met with the AES case definition were included in our study irrespective of age and sex. Vaccination history was taken from all the participants. Two milliliter of blood samples were collected from the suspected cases. Following serum

separation, enzyme linked immunosorbent assay was done for detecting human immunoglobulin M (IgM) antibodies to JE. The study was carried out in North Lakhimpur Civil Hospital, Assam.

Results

Till December, 2014, a total of 96 numbers of AES/JE cases were detected in Lakhimpur district, Assam. Among the total AES/JE patients, 27.08% cases were below 15 years age group and the remaining cases belonged to adult age groups. The positivity rate for JE was 22.92%. Five numbers of AES cases were found to be equivocal. The remaining 69 cases were found to be JE negative. The case fatality rate for AES and JE was 5.41% and 13.64% respectively. Maximum positivity rate for JE cases was observed from Dhalpur areas whereas highest cases fatality rate for JE was recorded from Bihpuria and Dhalpur area (Table 1). Highest numbers of AES/JE cases were reported from Boginodi and Nowboicha area.

The first AES case was reported on 4th January, 2014. Since then few sporadic cases were observed upto June. However the incidence of AES/JE was increased abruptly during July, 2014.

In 2014, the first JE positive case was detected in 1st July from Bihpuria block area. The last JE positive case was noticed on 31st October. Out of 96 AES/JE cases reported so far, 58 cases were observed during the month of July. A total of seven deaths occurred due to AES/JE of which six cases expired during July and the remaining one death occurred in August. However, out of total three deaths due to JE, one was children and remaining two were adults. Children below 15 years of age groups were more susceptible to JE infection, detected in 59.09% cases. The remaining 41.91% JE cases were belonged to adult age groups (Table 2). Males are more vulnerable for JE infection. The overall vaccination coverage in

Lakhimpur district was almost 80-83%. From vaccination history it was observed that all the seven patients expired due to AES/JE were not vaccinated, as they were not present in their locality during

vaccination period (Table 3). Almost 38% JE positive patients were vaccinated and remaining cases were not immunized with SA-14-1-4-2.

Table 1: Areas wise number of AES/JE cases and deaths, positivity rate and case fatality rate

Name of District	Name of the BPHC	Total No. of AES/JE Cases & Deaths		No. of JE +ve cases & deaths		Positivity Rate	CFR of JE +ve
		Cases	Deaths	Cases	Deaths		
LAKHIMPUR DISTRICT	Dhalpur BPHC	4	1	2	1	50.00	50.00
	Bihpuria BPHC	14	3	4	2	28.57	50.00
	Nowboicha BPHC	27	1	6	0	22.22	-----
	Boginodi BPHC	29	2	4	0	13.79	-----
	Ghilamora BPHC	6	0	1	0	16.67	-----
	Dhakuakhana BPHC	8	0	3	0	37.50	-----
	Urban	8	0	2	0	25.00	-----

Table 2: Age group/sex wise distribution of AES/JE cases and deaths

Cases	Age group wise AES/JE cases and deaths										Total	
	0-5		6-15		16-30		31-60		61 above		C	D
AES	12	1	13	2	22	1	20	0	7	0	74	4
JE	8	1	5	0	5	1	4	1	0	0	22	3
Cases	Sex wise age groups of AES/JE cases										Total	
	M	F	M	F	M	F	M	F	M	F	M	F
AES	10	2	7	6	17	5	10	10	5	2	49	25
JE	3	5	4	1	4	1	2	2	0	0	13	9

Cases (C), death (D), Male (M), Female (F)

The district health authority has taken many steps to control the spread of JE infection. Active door to door surveillance was done in all the affected areas. A total of six mobile medical units (MMU) vans were in position covering almost 201 villages during July to August.

Fogging was done in approximately 75-80 mostly affected areas, mainly from town area. A total of 5635 nos. of bed nets were impregnated with insecticides. Beside this 297 nos. of awareness camp regarding information, education and communication (IEC) and behavior change communication (BCC) were undertaken.

Table 3: Vaccination Status for AES/JE

Name of BPHC	Total Cases	Total AES Vaccinated cases	JE (+)ve Cases		AES Death		JE Death		Total Death
			Total	JE Vaccinated	Total	JE Vaccinated	Total	JE Vaccinated	
Dhalpur	4	1	2	0	0	0	1	0	1
Bihpuria	14	0	4	1	1	0	2	0	3
Nowboicha	27	3	6	3	1	0	0	0	1
Boginodi	29	2	4	0	2	0	0	0	2
Ghilamora	6	2	1	0	0	0	0	0	0
Dhakuakhana	8	3	3	3	0	0	0	0	0
Urban Centre	8	0	2	1	0	0	0	0	0

DISCUSSION

In our study, the trend of AES/JE cases increases suddenly in 2014 as compared to previous year [3]. Following vaccination in February, 2014, it was believed that the incidence of AES/JE will come down slowly. But the result showed opposite findings. This may be due to the low coverage of JE vaccination. The participants were not aware of the JE campaign and its benefits. Some people have refused to take JE vaccine. Otherwise the proper maintenance of the vaccines is also questionable in village areas. However, one of the observable facts was that the JE positive patients who were already taken JE vaccine were recovered completely from the illness without long term sequelae as compared to unvaccinated JE patients. In this sense the vaccination is believed to be effective. Due to vaccination, case fatality rate of JE decreases. The people from all the age groups were vulnerable for JE infection which is in accordance with earlier finding [3, 8]. An epidemiological age shift has been noted among the AES/JE cases in these outbreaks. Males were more affected as they were more engaged in outdoor activities. To avoid the risk, people

should take the general precautionary measures such as by using insecticide treated mosquito nets, keep away from contact with animals etc.

CONCLUSION

Following vaccination, recurrence of JE cases with high incidence rate in Assam is a serious issue. By vaccinating the entire people in Assam, one can expect to eliminate JE infection from this part of India.

REFERENCES

- Sharma, J. Dutta, P. Khan, S.A. Chowdhury, P. Borah, J. Mahanta, J. Comparison of different diagnostic techniques for detection of Malaria infection in blood samples collected from Malaria endemic areas of Assam and Arunachal Pradesh. *International journal of scientific and engineering research.*, 2013. 4 (9):2587-2603.
- Sharma, J. Malakar, M. Distribution of Typhoid fever in different rural and urban areas of Lakhimpur district of Assam.

- International journal of research and development of health*, 2013. 1 (3):109-114.
3. Sharma, J. Das, J.N. Pathak, A. Surveillance of Acute encephalitis syndrome in Lakhimpur District of Assam: January 2008-October 2012. *Golden Research thought*, 2013. 3(3):1-3.
 4. Sharma, J. Malakar, M. Soni, M. Pathak, A. Outbreak of Cholera in some villages of Boginodi area in Lakhimpur district of Assam. *International Journal of Pharmacy and Biological Sciences*, 2013. 3 (3): 450-454.
 5. Sharma, J. Pawe, M. Appearance of insecticide resistance capability among malaria causing mosquito vectors: an apprehension in developed and developing nation. *International Journal of Pharmacy and Biological Sciences*, 2013. 3 (4): 86-90.
 6. Sharma, J. Malakar, M. Gupta, S. Inhabitants believe on quack grounds for reemergence of viral hepatitis cases in Lakhimpur district of Assam. *Advances in Applied Science Research*, 2013. 4 (6): 242-245.
 7. Sharma, J. Malakar, M. Gupta, S. Dhandar, A.R. Food Poisoning: A cause for anxiety in Lakhimpur district of Assam. *Annals of Biological Research*, 2014.5 (1):46-49.
 8. Sharma, J. Baruah, M.K. Pathak, A. Khan, S.A. Dutta, P. Epidemiology of Japanese encephalitis cases in Dhemaji district of Assam, India. *Annals of Biological Research*, 2014. 5 (1):50-54.
 9. Sharma, J. Malakar, M. Das, J. Outbreak of Rubella cases in Lakhimpur district of Assam. *Entomology and Applied Science Letters*, 2014. 1(3):49-52.
 10. Sharma, J. Prevalence of malaria cases in tea garden areas of Lakhimpur district, Assam. *International Journal of Pharmacy and Pharmaceutical Sciences*. 2014. 6 (8): 571-573.