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## *Letters to the Editor*

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### **Vaccination Programme for Japanese Encephalitis**

Japanese encephalitis (JE), a mosquito borne disease caused by group B arbovirus (Flavivirus) and transmitted by culicine mosquitoes notably *C. tritaeniorhynchus*, *C. vishnii* and *C. gelidus*, occurs in epidemic form almost regularly in many of the states of India. It was first recognized serologically in Tamil Nadu in 1955(1). The National Institute of virology, Pune, indicated that about half the population in south India was seropositive(2). A major upsurge of the disease usually occurs every year from end of October to beginning of December with a peak period in the last week of October to 3rd week of November. Immunization results in high (85-91%) seroconversion rates(3) and is reported to be an effective modality for controlling the disease(2). However, no well-designed study on JE immunization has yet been carried out in India. The Central Research Institute, Kasauli produces about 2 million doses of the vaccine that can cover nearly 7 lakh population whereas it has been estimated that around 378 million people live in JE prone areas(2).

The Departments of Pediatrics and Community Medicine, Burdwan Medical College, West Bengal conducted a clinical and serological surveillance from 1988-94 to evaluate the effectiveness of the vaccine and percentage of seropositive population in four endemic zones, namely, Memari II and Jamalpur Blocks in Burdwan district and Chatna and Gangajalghati Blocks in the adjoining Bankura district. A killed

"mouse-brain" vaccine of Nakayama NIH strain was used. As per recommendation of the National Institute of Health (NIH), Japan, for primary immunization, 2 doses of 1 ml each (0.5 ml for children under age of 3 years) were administered subcutaneously at an interval of 7 to 14 days. A booster injection of 1 ml was given after 6 months for full protection. The vaccination programme was started in March and completed in September for full immunization at least one month prior to the usual commencement of the disease in epidemic form.

Due to paucity of vaccine, only the most vulnerable and high-risk group, namely 5-25 years of age was selected for the study as per earlier recommendations. The total population in that age group in the four blocks was 1,75,905; first dose of vaccine was administered to 78.3% of the population, out of which 87.8% turned up for second dose and of them 73.9% appeared for third dose. Thus only 89,439 (50.8%) of the 5-25 year old total population could be completely immunized. Vaccination was started in Memari II in 1988, Jamalpur in 1990, Chatna in 1992 and Gangajalghati in 1994. Before commencement of vaccination programme, blood sample, of 336 persons, selected on random basis, were tested for estimation of Hemagglutination Inhibiting (HI) antibody titer against JE virus by Clarke and Cassalls method at School of Tropical Medicine, Calcutta. One hundred and fifty two (45.2%) were seropositive (Hi-antibody titer 1:20 or more). After completion of vaccination programme, antibody titer was repeated in 184 previously seronegative cases. Of them, 155 (84.2%) became seropositive. The seroconversion rate of JE vaccine was observed to be com-

TABLE I—Change in Estimated Profile of JE in Study Areas.

Year	Memari-II			Jamalpur			Chatna			C. Ghati		
	IR	CFR (%)	SDR	IR	CFR (%)	SDR	IR	CFR (%)	SDR	IR	CER (%)	SDR
1987	0.89 (58)	27.6 (16)	0.24	—	—	—	—	—	—	—	—	—
1988	0.55 (36)	25 (9)	0.13	—	—	—	—	—	—	—	—	—
1989	0.27 (18)	61 (11)	0.16	0.49 (30)	33.3 (10)	0.16	—	—	—	—	—	—
1990	0.39 (26)	53.8 (14)	0.21	0.29 (18)	16.6 (3)	0.05	—	—	—	—	—	—
1991	0.09 (6)	66.7 (4)	0.06	0.11 (7)	14.3 (1)	0.01	1.2 (22)	59 (13)	0.71	—	—	—
1992	0.2 (13)	53.8 (7)	0.1	0.11 (7)	14.3 (1)	0.01	0.88 (16)	56.2 (9)	0.49	—	—	—
1993	0.15 (10)	30 (3)	0.04	0.13 (8)	50 (4)	0.06	0.66 (12)	33.3 (4)	.22	1.02 (32)	53.1 (17)	0.54
1994	0.12 (8)	37.5 (3)	0.04	0.03 (2)	0 (0)	0	0.44 (8)	50 (4)	000.22	0.67 (21)	57.1 (12)	0.38

IR = Incidence rate; CFR = Case fatality rate,

SDR = Specific death rate.

Figures in parentheses represent the total number of cases and death due to JE in respective study areas.

parable to that of Korean and Thailand studies(3). With the introduction of vaccination, there was concomitant reduction in the estimated incidence and specific death rate of JE in the study areas (*Table I*). However interestingly the case fatality rate before and after vaccination remained almost unchanged. It also varied widely from year to year and place to place. A similar observation has been made earlier and attributed to difference in virulence of the virus.

In conclusion, the results of this study indicate that it would be beneficial to routinely immunize the population at risk for JE in endemic areas.

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#### REFERENCES

1. Choudhury N, Shaw BP, Mondal KC, Maity CR. Epidemiology of Japanese encephalitis; *Indian Pediatr* 1992; 29: 861-865.
2. Mukherjee B. A note on epidemiology of Japanese encephalitis in India and strategy of control. *Proceedings of Indian Academy of Pediatrics Eastern Zonal Conference, 1989*, pp 1-17.
3. Pattanayak S. Japanese ecephalitis in South East Asia and Western Pacific Regions of World Health Organization. *In: Proceedings of the Workshop on Japanese Encephalitis. January 18-22, 1988, Delhi, National Institute of communicable Disease.*