AN EPIDEMIC OF ENCEPHALITIS IN HARYANA: SEROLOGICAL EVIDENCE OF JAPANESE ENCEPHALITIS IN A FEW PATIENTS

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ABSTRACT

An epidemic of encephalitis occurred in the eastern, paddy growing districts of Haryana state between July and November 1990. One hundred and eighty-two patients with encephalitis were admitted to different hospitals in Haryana and 118 of them expired (mortality rate 64.8%); 88% of the patients were children. The male to female ratio was 2.3: 1. IgM class of antibodies to Japanese Encephalitis (JE) Virus could be demonstrated in the CSF and/or sera of 3 surviving and 2 fatal patients of the 19 patients studied. This is the first detailed report on an epidemic of encephalitis in North-Western part of India. Serologically proven cases of JE are being reported, for the first time, from this region.

Key words: *Epidemic encephalitis, Japanese encephalitis.*

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An epidemic of encephalitis, mainly involving children occurred in Haryana state during the second half of 1990(1). This report presents a picture of the epidemic based on the hospital records of the state and clinical and serological findings in a few encephalitis patients seen during the epidemic.

Material and Methods

The available data on age, sex, address, date of onset of illness, date of admission to the hospital, and the outcome of the illness of the encephalitis cases admitted to different hospitals of Haryana state was analyzed. The data was provided by the Department of Health and Family Welfare, Government of Haryana.

Clinical and serological observations were made on 19 patients: 16 patients admitted at Postgraduate Institute of Medical Education and Research, Chandigarh and 3 patients admitted at the District Hospital, Kaithal. Cerebrospinal fluid (CSF) and/or serum from the above 19 patients were tested in MAC ELISA test against Japanese Encephalitis (JE), West Nile (WN) and Dengue (DEN-2) antigens(2) by the National Institute of Virology, Pune. Hemagglutination inhibition (HI) test could be done on the sera of 6 patients against JE, WN and DEN-2 antigens(3).

Results

One hundred and eight-two patients with encephalitis were admitted to hospitals in Haryana state during 1990 and 118 of them had expired (case fatality rate 64.8%). The region-wise distribution of these hospitalized encephalitis cases and the fatal cases amongst them are presented in *Fig. 1*. Eastern parts of Haryana between Kurukshetra and Rohtak districts were mainly affected. Most of the patients came from villages; however, 20 patients were from towns. One

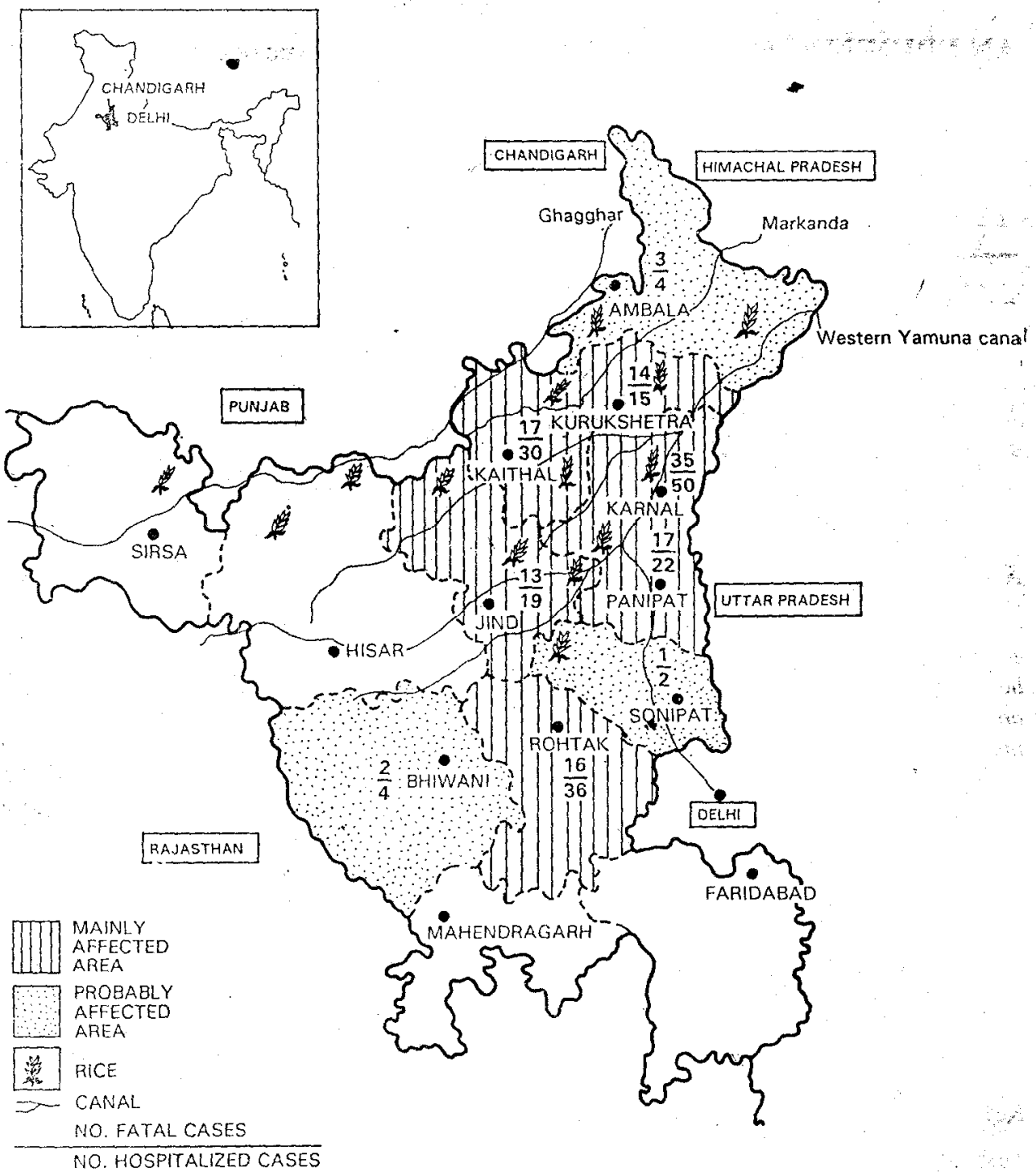

Fig. 1

case per affected village was the common pattern.

The month-wise admissions to the hospitals of encephalitis patients and the mortality data, available for 172 patients, when analyzed shows that there was a steep rise in admissions in September and a peak was reached in October. Thereafter, there was a fall in admissions and no cases were admitted after December.

There were 119 cases in males and 53 in females (M : F ratio = 2.3 : 1). One

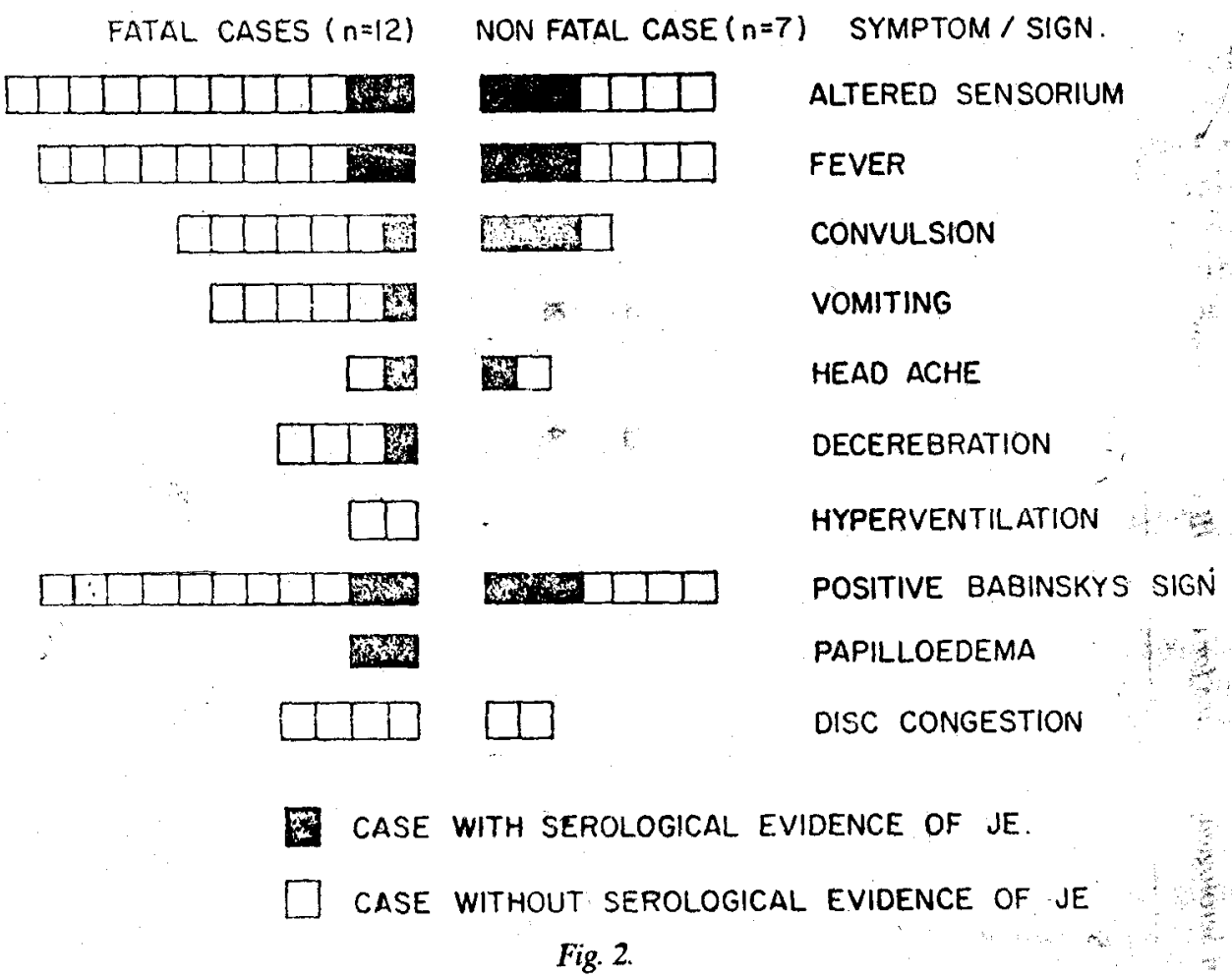

Fig. 2.

hundered and fifty-two (88%) cases were below 15 years of age. The preschool age (1-4 years) and school age (5-14 years) groups were mainly affected in both the sexes and patients of these age groups contributed maximally towards the mortality rate. The median age for boys was 8 years and mode age was 3.9 years. The corresponding figures for girls were 6.6 and 5.4 years, respectively.

The interval between onset of illness and admission to the hospital was recorded in 44 fatal patients and 17 nonfatal patients. The mean interval between onset and hospitalization in fatal cases was 3.94 days (range 1-23 days) and for non-fatal cases it was 1.94 days (range 1-4 days). The mean duration of hospital stay for 97 fatal cases was 1.88 days.

Detailed clinical observations were made in 19 patients: 12 children who expired and 7 who survived. The salient features seen during the acute stage of illness are presented in *Fig. 2*. In 95% of the cases, the onset was with moderate grade, intermittent fever which was associated with chills in about one-third. One child who died within the first 24 hours of illness, had no fever. During their hospital stay, 3 patients had documented temperature records of more than 40°C a few hours prior to death. Fever lasted for about 6-7 days in those who survived and no recurrence was observed. Seizures were seen in both fatal and non-fatal cases but recurrent or persistent seizures, even after appropriate therapy, decerebrations, hyperventilation and papilledema were observed only in fatal cases. Aphasia, rigidity and extrapyramidal movements of neck

TABLE 1—*Details of the Patients with Serological Evidence for Recent JB Viral Infection*

Sl No.	Name & Address	Age/Sex	Date of onset*	POD of specimen	Specimen tested	Results of MAC ELISA test for anti-JEV IgM	Results of HI test			Outcome of illness
							JE	WH	DEN-2	
1.	S. Shiv Colony Karnal	6 F	1 Sep. 90	45	Serum	+	320	320	40	Survived
2.	K. Daund Kaithal	7 F	6 Oct. 90	11	Serum	+	320	320	20	Survived
					CSF	+	.....			
3.	K. Daund	5 F	27 Sept. 90	20	Serum	+	160	40	20	Survived
					CSF	-	.....			
				50	Serum	+	ND	ND	ND**	
					CSF	+	.....			
4.	O. Shergarh Ambala	12 M	15 Sept.90	30	CSF	+	.....			Expired
5.	K.K. Baranaj Karnal	8 F	23 Oct. 90	7	CSF	+	.....			Expired

*POD: Post onset day of illness.
**ND: Not done.

and trunk were seen as residual manifestations in survivors at the time of discharge.

CSF was analyzed in 7 of the 19 patients. Five showed lymphocytic pleocytosis (20-40 cells/cu mm). Proteins were moderately raised in 6 of 7 patients (46-75 mg/dl). Sugar levels were within normal limits. Gram stain examination and culture were negative for bacterial pathogens.

IgM class of antibodies to JE virus was demonstrated in the CSF and/or serum of 5 of the 19 encephalitis patients. The details are presented in *Table I*. The HI test carried out on the convalescent samples of the 3 survivors positive for IgM class of antibodies also showed high titres of antibodies to JE/WN viruses. The temporal and spatial distribution and clinical picture (*Fig. 2*) of patients showing serological evidence of recent JE viral infection was similar to that of other encephalitis patients who were negative for JE viral IgM antibodies.

Discussion

The epidemic of encephalitis in Haryana described here is apparently, the first epidemic of encephalitis in the North-Western region of India. Among the states neighboring Haryana, epidemics of encephalitis have been described only from the eastern parts of Uttar Pradesh(4,5). The age group of patients involved, preponderance of male patients, and rural distribution were common features between the present epidemic and the epidemics in Eastern parts of Uttar Pradesh.

Five of the 19 patients studied by us had serological evidence for recent JE viral infection. IgM class of antibodies to JE virus could be demonstrated in the CSF of 4 of these patients, which has been considered diagnostic of Japanese encephalitis(6). These patients came from regions of Haryana intensively cultivating paddy (*Fig. 1*). These observations despite the small number of patients studied, suggest that JE viral infection could have been responsible, atleast for some of the patients seen during the epidemic. Our report provides serological evidence for JE infections in North Western India where it was earlier thought to be non-existent(7).

The case fatality rate of 65% observed in this epidemic is usually high for an epidemic of JE(8). Delay in hospitalization and lack of proper medical and nursing care at home might have resulted in many fatal cases. Mortality was higher in younger children. Cases with hyperpyrexia (>40°C), hyperventilation, decerebration or recurrent seizures were associated with a fatal outcome. However, in one case, the disease followed a fulminant course with an abrupt onset of CNS symptoms and rapid progression in the absence of fever. The lack of serological evidence for JE in 14 of the 19 patients studied by us calls for studies on the role of other encephalitogenic agents in such epidemics in Haryana region.

In the wake of the epidemic the Department of Health and Family Welfare, Haryana, sprayed the houses in the neighbourhood of patients' residences and the pigstys with insecticides. It undertook measures to educate public on the nature of disease, transmission and prevention of JE. The facilities at hospitals to treat encephalitis patients were strengthened. Anti-JE vaccine was requisitioned from the Central Research Institute, Kasauli for future use.

Most of the epidemics of JE in Southern India, West Bengal, Bihar, Assam and Uttar Pradesh, occur during the later half of the year following South West monsoon and consequent paddy cultivation which enhances mosquitogenic conditions(9). However, epidemics also have occurred sometimes between April and June in Mandya District

of Karnataka and between May and August in West Bengal(10,11). The seasonal incidence of Haryana epidemic described here conforms with the common pattern.

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