

Letter to the Editor



A Centralized Report on Pediatric Japanese Encephalitis Cases from Beijing Children's Hospital, 2013*

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Fifteen pediatric cases of suspected Japanese encephalitis (JE) were reported in Beijing Children's Hospital during the late summer of 2013. The clinical manifestations in most cases included high fever, seizures, and abnormal magnetic resonance imaging findings. Twelve of 15 cases were laboratory-confirmed as JE cases by pathogen identification. Epidemiological investigations showed that five of the 12 laboratory-confirmed patients had an incomplete JE vaccination history. Follow-up investigations after discharge indicated that seven laboratory-confirmed JE patients without JE vaccinations had relatively poor prognoses, with an average Modified Rankin Scale (MRS) score of 2.6 when compared with the other five laboratory-confirmed, JE-vaccinated patients with an average MRS score of 0.5. The observation of pediatric JE cases among those with a history of JE vaccination warrants further attention.

Key words: Japanese encephalitis; Pediatric; Prognoses

Japanese encephalitis (JE), one of the most serious viral encephalitis, is a mosquito-borne encephalitis induced by infection with Japanese encephalitis virus (JEV), which belongs to the genus *Flavivirus*, family *Flaviviridae*. JE remains a major health problem worldwide, especially in Asia, the Western Pacific, and Northern Australia, with approximately 70,000 cases and 15,000 deaths

reported annually; 30%-50% survivors live with irreversible neurological damage^[1]. Infection with JEV is often asymptomatic, and children under 15 years of age are principally affected in endemic areas^[2].

JE immunization was initially implemented in the eastern coastal areas or relatively economically developed provinces in China since 1968 and has been included in 28 provinces (excluding Qinghai, Xinjiang, and Tibet) in national immunization programs since 2008^[2]. At the same time, improvements in laboratory diagnosis of JE have strengthened the quality of the clinical reports of JE cases. In recent years, there has been a marked decrease in the number of JE cases, from 10,308 in 1996 to 2,541 in 2010^[3].

According to JE incidence, Hebei Province is a low-endemic area in China with an annual reported number of JE cases ranging from 12 to 37 from 2007 to 2010. However, a JE outbreak of 234 cases was observed in Hebei Province in 2013. A similar situation was also observed in other areas of China, such as Shandong Province, with 407 cases reported in 2013^[4]. Owing to the close geographical distance between Hebei and Beijing and the better medical environment in Beijing, most serious cases, such as encephalitis, are referred to Beijing for medical treatment. Herein, we report the results of a systematic study of a cluster of pediatric JE patients

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reported in Hebei but hospitalized in Beijing Children’s Hospital, including their clinical manifestations, clinical outcomes, laboratory test results, JE vaccination history, and prognoses after discharge.

In accordance with the manual for JE diagnosis from the World Health Organization (WHO)^[5], we used the following definition in this study. A case of acute encephalitis syndrome (AES) was 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, disorientation, coma, or inability to talk) and/or new onset of seizures (excluding simple febrile seizures). Suspected JE was defined as an AES case that occurred during the JE epidemic. Laboratory-confirmed JE was defined as a suspected JE case for which there was laboratory confirmation of the presence of JEV-specific immunoglobulin M (IgM) in a single cerebrospinal fluid (CSF) or serum sample, detection of JEV RNA in the CSF using hemi-nested reverse transcriptase polymerase chain reaction (hnRT-PCR), or the isolation and identification of JEV from CSF.

In this study, 15 pediatric patients with suspected JE were hospitalized in Beijing Children’s Hospital from September 5 to October 8, 2013. They were all from Hebei Province, neighboring Beijing. The details of the patients’ history and clinical findings were recorded on standardized forms. Fever, seizures, behavioral abnormalities, focal weakness, and reflex changes were noted in all patients. The level of consciousness was assessed using the

Glasgow coma scale (GCS). The patients showed a broad spectrum of clinical presentations ranging from brief illness lacking specific features to a protracted course of illness with varying severity. The clinical features of the 15 cases are shown in Table 1. High or moderate fever was the most common clinical feature and was observed in all cases. History of seizures was reported in the majority of patients (86.67%, 13/15), and 10 of the 15 children had seizures within 3 days of illness onset. The GCS scores ranged from 3 to 15 (mean, 10.8 ± 1.32) at the time of hospitalization.

In cases of encephalitis, magnetic resonance imaging (MRI) is used to detect and evaluate the extent of lesions and to confirm or exclude a specific diagnosis. In this study, all patients underwent MRI of the brain using a 3.0 T scanner (Magnetom Avanto with Tim system; Siemens, Erlangen, Germany). T1-weighted [repetition time (TR)/echo time (TE)/excitation = 500/50/3 ms], proton density (TR/TE/excitation = 2000-2500/15-20/1 ms), and T2-weighted (TR/TE/excitation = 4000/80-90/1 ms) images were obtained. Susceptibility-weighted and diffusion-weighted imaging were performed in multiple planes. From the results of MRI (Table S1 in the website of BES, www.besjournal.com), the lesions appeared hyperintense in fluid attenuated inversion recovery (FLAIR) and T2-weighted images and isointense to slightly hypointense in T1-weighted images. The MRI results were more frequently abnormal with involvement of the thalamus (12/15) and neocortex (8/15). Involvement of the basal

Table 1. Clinical Manifestations of Fifteen Pediatric Cases with Suspected JE

Patients No.	Sex	Age	Location	Fever	GCS	Seizure Occurred
1	F	6	Langfang	2-4 times/d, T _{max} 40.2 °C	6	From 3 th day after onset
2	F	8	Langfang	2 times/d, T _{max} 39.0 °C	8	—
3	F	9	Langfang	2-3 times/d, T _{max} 38.5 °C	6	onset
4	F	4	Langfang	3-4 times/d, T _{max} 40.0 °C	4	From 3 th day after onset
5	M	11	Langfang	2-3 times/d, T _{max} 40.5.0 °C	4	From 3 th day after onset
6	F	5	Handan	1-3 times/d, T _{max} 39.0 °C	3	From 3 th day after onset
7	F	10	Baoding	2-3 times/d, T _{max} 39.0 °C	3	From 5 th day after onset
8	M	6	Baoding	2-3 times/d, T _{max} 40.0 °C	6	From first day after onset
9	F	7	Langfang	2-3 times/d, T _{max} 39.0 °C	10	—
10	F	8	Langfang	2-3 times/d, T _{max} 38.5 °C	6	From 3 th day after onset
11	M	3	Baoding	3 times/d, T _{max} 39.7 °C	4	From 2 nd day after onset
12	F	6	Shijiazhuang	1-3 times/d, T _{max} 40.0 °C	4	From 10 th day after onset
13	F	6	Baoding	5-6 times/d, T _{max} 41.0 °C	13	From 4 th day after onset
14	M	4	Baoding	2-3 times/d, T _{max} 40.1 °C	7	From 3 th day after onset
15	M	2	Baoding	3-4 times/d, T _{max} 39.7 °C	15	From 3 th day after onset

Note. F: female; M: male; GCS: the Glasgow coma scale; ‘—’: no seizure.

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