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CLINICAL STUDY OF PARTIAL EPILEPSIES OCCURRING BEFORE TWO YEARS OF LIFE

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We analyzed the clinical features of 13 cases (9 boys, 4 girls) with partial epilepsies occurring before 2 years of life. Eight patients developed epilepsy between 4 and 11 months of age (average, 10.9 months). Five patients had complex partial seizures (CPS) alone, 3 had partial seizures evolving to secondarily generalized seizures (PSG) alone, and 5 had both CPS and PSG. Ten patients had clusters of seizures. The most common ictal manifestations were motor phenomena and motionless stares or arrests. Automatisms were noticed in 2 patients, and rarer than in elder childhood or adolescence. The polytherapy of antiepileptic drugs (AED) were needed to control seizures in patients with symptomatic etiology as indicated in previous studies. On the other hand, 5 patients showed normal interictal EEGs, normal development and good response to the AED treatment in spite of the occurrence of clusters of seizures. We concluded that these patients corresponded with benign partial epilepsy in infancy and could have favorable outcome.

Key words: Partial epilepsy / Early onset / Infant / Clinical feature

Early onset of seizures is generally considered an unfavorable prognostic factor. The prognosis of partial epilepsies in infancy is also considered poor. Many previous reports describe that partial seizures beginning in infancy are intractable and are frequently associated with neurologic and intellectual impairement (1-3). On the other hand, some investigators describe cryptogenetic partial epilepsies in infancy with relatively favorable outcome (4,5), and others report benign partial epilepsies with easily controlled complex paritial seizures (CPS) or partial seizures evolving to secondarily generalized seizures (PSG), and normal development like an idiopathic epilepsy (6-8). According to these reports, partial epilepsies in infancy are seemed to be heterogenous in nature and clinical spectrum. We studied the clinical features of partial epilepsies of 13 cases with seizures appearing before 2 years of life.

PATIENTS AND METHODS

From January 1991 to December 1995, 12 patients (8 boys, 4 girls) with partial epilepsies with seizures occurring less than 2 years of age were examined and treated in the Department of Pediatrics of Shimane Medical University Hospital or Oki Hospital. In addition to the above 12 patients, a boy whose first seizure occurred on January 1985 was included. Partial epilepsy was defined as more than two nonfebrile unprovoked partial seizures and the complete exclusion of other non-epileptic paroxysmal disorders such as breath holding spell and pallid infantile syncope. We included a case of single seizure (case 7), because the ictal manifestation was related to the epileptiform activity on the interictal EEG recordings. Partial seizures were diagnosed according to the ILAE Classification of Epileptic Seizures (9). Ictal manifestations were analyzed by reviewing ictal recordings using a video-EEG monitoring or a home-video-recorder. Patients without ictal recordings had at least one seizure observed by one of our physicians. All children underwent at least two interictal EEG recording. Electrodes were placed according to the 10-20 International System, and focal epileptiform activity was defined as spikes or sharp waves recommended by the Committee on Terminology at the Eigth International Congress of EEG and Clinical Neurophysiology (10). Computed tomography (CT) scan was performed in all patients and magnetic resonance imaging (MRI) scan was performed in 10 patients. Special attention was paid to the clinical features of seizures, and the responses to the treatment and the clinical course.

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RESULTS

Table 1 shows the clinical profiles of all the 13 patients. In these patients, there were two pairs of siblings (cases 1, 2 and cases 3, 4, respectively). The father of a patient (case 10) had epilepsy with favorable outcome in childhood, but details were unclear. There was no family history of seizure disorders in the other 8 patients. Eight of 13 patients (61%) developed epilepsy between 4 and 11 months of age, and the average age of onset was 10.9 months (range 4 to 23 months).

Features of seizures

Five patients had CPS alone, 3 had PSG alone, and 5 had both CPS and PSG. Ten of 13 patients (77%) had clusters of seizures.

Table 2 shows the clinical features of seizures of the patients. Clonic hemiconvulsions or secondarily generalized tonic-clonic convulsions were noted in 10 patients. One patient (case 8) showed a Todd's

paralysis after the prolonged hemiconvulsions. Motionless stares or arrests were also noted in 10 patients. These manifestations were not only the symptoms of CPS but also those preceding PSG. Hypertonic postures with the symptoms such as flushing, apnea and cyanosis occurred in 5 patients. Phonatory occurred in 4 patients. Lateralized tonic posturing of one upper extremity with either adversive or contraversive head and eye deviation occurred in 3 patients. In 3 patients aged over 1 year, an aura was detected. These children approached their mothers with a facial expression of fear, and other ictal manifestations occurred subsequently. Automatisms consisting of chewing or pedalling leg movements were noticed in 2 patients.

EEG features and CT, MRI findings

Interictal EEG showed focal epileptiform activity in 6 patients. In one patient (case 8), slow, biphasic, high-voltage, and centro-temporal spikes activated by sleep, which are typically found in benign partial epilepsy of childhood with centrotemporal spikes (BECT), were frequently observed. In other 5 patients, focal spikes were occasionally or sporadically observed, and completely disappeared at the follow up EEG after the treatment in 2 (cases 6 and 7). Seven patients had normal interictal EEG findings, but 2 (cases 9 and 10) had ictal EEG recordings. In case 9, ictal EEG showed focal discharges in the left central region. They were characterized by low-voltage repetitive spikes of increasing amplitude and decreasing frequency which spread to the contralateral and adjacent regions then to all areas. During the CPS of motionless stare and arrest, initial EEG discharges of delta waves mixed with sharp waves were localized in the left temporal region and then rapidly spread to the same and ipsilateral hemisphere in case 10.

In CT findings, 2 patients showed diffuse mild brain atrophy. In other 11 patients, no special abnormalities were found in CT scan. In MRI findings, the same patients showed diffuse mild brain atrophy as in CT findings, but focal lesions correponded with seizure origin were not found. In other 8 patients, MRI findings were normal.

Clinical course

Fig. 1 shows the antiepileptic drugs (AEDs) used for the treatment, duration of the medication and the developmental outcome of each patient. Seizure remission was obtained in eight patients over 1 year and the medication of AEDs could be stopped in 6 of these 8 patients. Development was normal in 9 patients (cases 1-9) who had idiopathic or cryptogenic etiology, whereas it was mildly retarded in 4 (cases 10-13) who had symptomatic etiology. Although clusters of seizures occurred at the early stage of the onset of epilepsy in many patients, seizures were easily ceased with carbamazepine in most patients with idiopathic or cryptogenic etiology (cases 1-6). On the other hand, great efforts and the combinations of AEDs were needed to control seizures in patients with symptomatic etiology (cases 10-13). Furthermore, several trials of increase of AED dosage or exchanges of AEDs had been needed to control seizures in case 8 in

Table 1. Clinical features of patients with partial epilepsy

Case	Sex	Age of onset (month)	Seizure classification	Cluters of seizures	Interictal EEG findings	CT, MRI findings
1	M	4	CPS, PSG	(+)	N	N
2	F	8	CPS, PSG	(+)	N	N
3	M	4	CPS, PSG	(+)	N	N
4	F	4	CPS, PSG	(+)	N	N
5	M	11	CPS	(+)	N	N
6	M	8	CPS, PSG	(+)	focal (rt f) spike	N
7	M	23	PSG	(-)	focal (lt f) spike	N
8	M	18	CPS	(-)	focal (rt c,mt) spike	N
9	M	19	PSG	(+)	N	N
10	F	11	CPS	(+)	N	mild brain atrophy
11	F	5	PSG	(-)	focal (bil. f, c) spike	mild brain atrophy
12	M	14	CPS	(+)	focal (rt f) sharp	N
13	M	13	CPS	(+)	focal (lt f, c) spike	N

Abbreviations:
M; male, F; female,
CPS; complex partial seizure, PSG; partial seizure with secondarily generalization,
N; normal, rt; right, lt; left, f; frontal region, c; central region,
mt; midtemporal region.

Table 2. Clincal features of seizures

Ictal manifestations	Number of patients
1. Motor phenomena (hemiconvulsion or secondarily generalized convulsion)	10
2. Motionless stare, arrest	10
3. Hypertonic posture	5
4. Phonatory	4
5. Versive phenomena	3
6. Aura	3
7. Automatisms	2

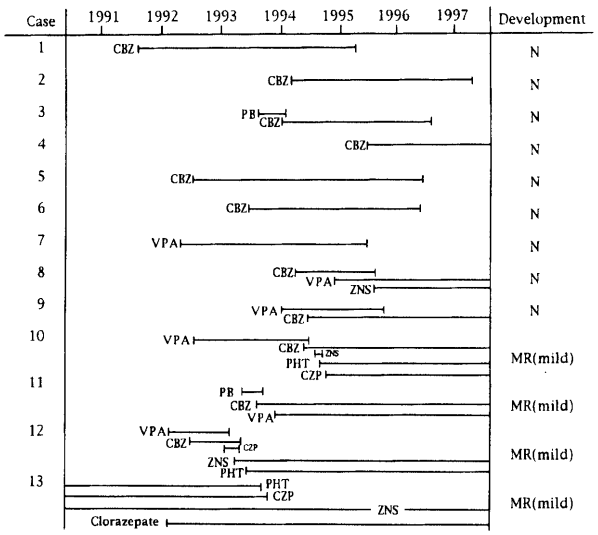

Fig. 1. The antiepileptic drugs used for the treatment, duration of the medication and the developmental outcome of each patient. Abbreviations: CBZ; carbamazepine, VPA; valproic acid, ZNS; zonisamide, CZP; clonazepam, PHT; phenytoin, MR; mental retardation.

spite of the interictal EEG findings corresponding with BECT.

DISCUSSION

In this study, we analyzed partial epilepsies occurring before 2 years of age, especially focusing on the clinical features of seizures and clinical course. As we included patients with PSG in this study, the most frequent ictal manifestations were both motor phenomena and motionless stares or arrests. On the other hand, automatisms were less common symptoms. Some previous studies restricted to the analyses of CPS and including elder children or adolecent patients disclose that automatisms are more common than motionless stares or arrests (11,12). In the studies restricted to youger children and infants, automatisms are less common symptoms of CPS, and motionless stare or arrest and hypertonic posturing are more frequent like our study (1,13,14). According to these investigations and our results, it seems that the nature of partial seizures in infancy are different from those in childhood or adolecence.

Previous reports indicate that partial epilepsies in infancy are intractable to the conventional AED treatment and their prognosis is poor (1-3). But these reports are hospital-based studies that may be biased toward more severe cases of patients with brain damages and intellecutual impairments. In this study, seizures in patients with symptomatic partial epilepsies were certainly intractable to the AED treatment as indicated in the previous studies, and the combination therapy of AEDs had been needed to control seizures. In contrast, most patients with idiopathic or cryptogenic partial epilepsies showed good response to the AED treatment. Watanabe et al. (6,7) propose the concept of a new epileptic syndrome and term it benign partial epilepsy in infancy (BPEI), although only three epileptic syndromes are classified into idiopathic partial epilepsies with good prognosis in the recent Internatinal Classification of Epilepsies and Epileptic Syndromes (15). It is characterized by the the following features: 1) CPS or PSG, or both, 2) normal development before and after onset, 3) no underlying disorders or neurological abnormalities, 4) normal interictal EEGs, 5) good respone to treatment with AED, 6) frequent occurrence of seizures in cluster, 7) occasional family history of benign seizures. In this study, clincal features of epilepsy in 5 patients (cases 1-5) fulfilled the above criteria. According to this fact, we take the entity of BPEI whose etiology must be idiopathic.

As for cryptogenic partial epilepsy, precise classifications are not proposed even in the recent Internatinal Classification of Epilepsies and Epileptic Syndromes (15). In our study, 2 patients (cases 6 and 7) showed good response to the AED treatment and favorable prognosis. On the other hand, several trials of an increase of AED dosage or exchanges of AEDs were needed to control seizures in other 2 (cases 8 and 9). Other studies also disclose the variety of response to the treatment and prognosis in cryptogenic partial epilepsies in infancy (4,5). We believe that there must be a new epileptic syndrome in the still unclear clinical entity.

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