

Case Report

Journal of Epilepsy Research

pISSN 2233-6249 / eISSN 2233-6257

Refractory Status Epilepticus Spontaneously Resolved by Parturition

Hye Seon Jeong, MD, Eung Seok Oh, MD, Ji Hee Lee, MD, Jae Moon Kim, MD, PhD

Department of Neurology, Chungnam National University Hospital, Daejeon, Korea

Status epilepticus (SE) in pregnancy is very rare, and there are only a few case reports of refractory SE (RSE) during pregnancy. The patient was a 27-year-old primigravida woman with a 21-year history of seizures from cortical dysplasia. At 23 weeks of pregnancy, the patient's seizure frequency progressively increased, and the patient came to the ER in a confused mental state and with intermittent convulsive movements of her left arm. Electroencephalography (EEG) revealed repeated seizures. She was admitted to the ICU, and continuous EEG monitoring was done. Treatment was immediately started with various anti-SE medications, but her SE was not controlled. A cesarean section was done, and SE spontaneously stopped two weeks after the parturition. Parturition may be beneficial and the best treatment option in pregnant patients with RSE. (2011;1:29-31)

Key words: Refractory status epilepticus; Pregnancy; Epilepsy

Received Nov. 25, 2010

Accepted Dec. 21, 2010

Corresponding author:

Jae Moon Kim

Department of Neurology, Chungnam

National University Hospital, 640

Daesa-dong, Jung-gu,

Daejeon 301-721, Korea

TeL. +82-42-280-7806

Fax. +82-42-252-8654

E-mail; jmoonkim@cnu.ac.kr

The main concerns with epilepsy during pregnancy are the maternal and fetal risks from uncontrolled seizures and the fetal exposure to antiepileptic drugs (AEDs). In spite of the fact that most studies have shown that pregnancy does not seem to significantly change seizure control in most women, there are diverse effects of pregnancy on epilepsy, which are explained by altered hormonal levels, a changed drug metabolism, and many psychobehavioral factors, such as compliance, stress, and emotional changes [1]. Status epilepticus (SE) in pregnancy is very rare, and there have been only a few case reports of refractory SE (RSE) during pregnancy in patients with systemic lupus erythematosus (SLE), porphyria, vitamin B6 deficiency, and cavernous angioma [2,3]. We report on a case of RSE in a patient with epilepsy from cortical dysplasia. The RSE was not controllable with any AEDs or other treatments, and it spontaneously resolved after parturition.

Case Report

The patient was a 27-year-old primigravida who was diagnosed as epilepsy with cortical dysplasia 21 years before. Her previous seizures were reasonably controlled by topiramate, carbamazepine, and pregabalin. At 23 weeks of pregnancy, her seizure frequency progressively increased. She came to the ER in a confused mental state with intermittent convulsive movements in her arm that lasted

for a few hours. On neurological examination, her mental status was stuporous, but there were no focal neurological deficits. Initial electroencephalography (EEG) revealed very frequent and sharp medium- to high-voltage waves in the left fronto-centro-parietal area that built up repetitive high-voltage, generalized sharp, and wave complexes for 10 to 20 sec, which suggested SE. These ictal rhythms were correlated with initial head and eyeball deviation that was secondary to generalized tonic-clonic seizures. Between the seizures, consciousness was not regained. Except for the pregnancy, there were neither precipitating factors nor laboratory abnormalities.

She was admitted to the ICU, and she was managed with a continuous infusion of intravenous midazolam under continuous EEG (c-EEG) monitoring. On the EEG, very frequent sharp waves with repetitive ictal rhythms appeared in the left centro-parieto-occipital area. Midazolam was titrated up to 5.5 mg/kg/h, but the ictal rhythms with clinical seizures were not successfully controlled. On the fifth hospital day (*HD 5th*), midazolam was dosed up to 17 mg/kg/h, her blood pressure was reduced to 80/50, but the repeated seizures were not controlled. We added 3,000 mg of levetiracetam per day. Midazolam was tapered slowly from *HD 10th* to *HD 16th*, and then her mental state and EEG findings were improved except for an occasional brief seizure. On *HD 32nd*, she was transferred to the ward with c-EEG monitoring. However, three days later, very frequent generalized seizures occurred again. Phenytoin, phenobarbital, and

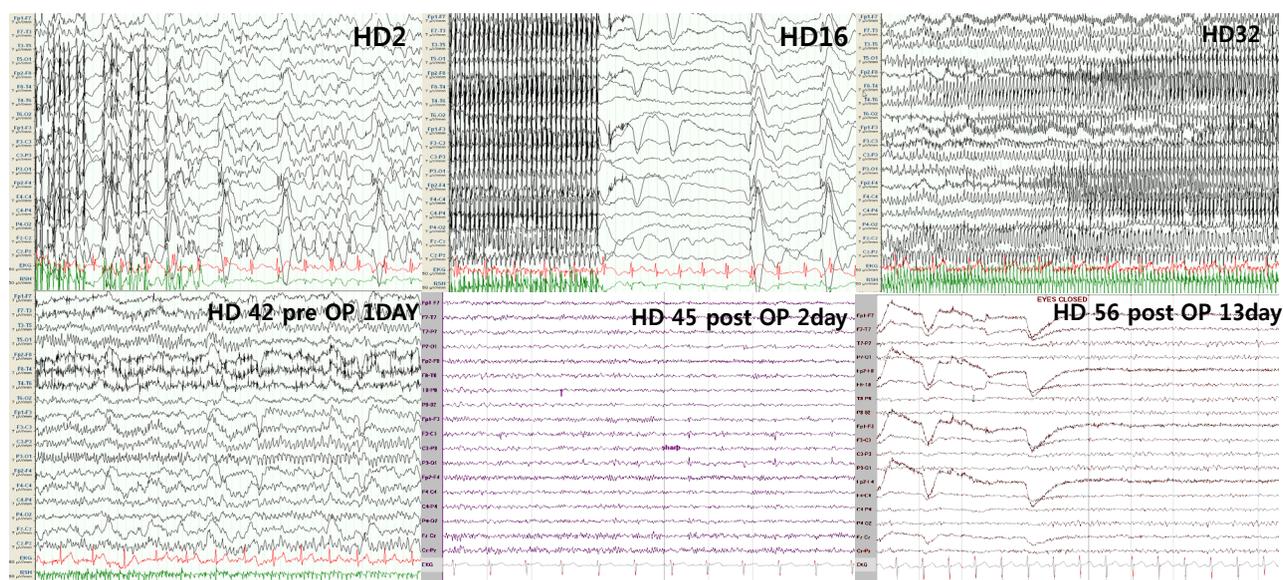


Figure 1. Serial EEG findings of the patient. Pre-operative EEGs showed intermittent or continuous ictal discharges, and which were normalized after the parturition.

pentobarbital were sequentially loaded for a few days with intervals, but SE continued.

On *HD 43rd*, at 29 weeks of pregnancy, a cesarean section was performed. After the parturition, the EEG gradually improved. The EEG performed the day after parturition showed only intermittent median voltage sharp waves in the left centro-parietal area. Her mentality gradually improved, and accordingly, previous anti-SE drugs were gradually tapered out. She was discharged with an alert mental status, and the discharge medications were topiramate (300 mg), pregabalin (450 mg), levetiracetam (3,000 mg), and phenobarbital (180 mg). Her baby was raised in the newborn section because of premature and low birth weight. However, he did not show any other neonatal problems.

Discussion

SE during pregnancy is a relatively rare condition. According to a recent review of many studies of women with epilepsy, the rate of seizure increase during pregnancy ranged from 14% to 32%. The frequency of SE during pregnancy was 0% to 1.3%, which was less than the annual frequency of 1.6% for SE reported in a large series of patients with epilepsy [4,5]. These studies were not case-controlled, and so there is insufficient evidence to support an increased risk of SE and seizure frequency with pregnancy. However, we can confirm that the seizure threshold can be influenced by many factors during

pregnancy, such as poor compliance and hormonal, pharmacokinetic, and emotional changes [1,6]. Therefore, SE in this state is not always predictable and preventable.

In our patient, the SE was not controllable by any antiepileptic drugs, including midazolam or pentobarbital, but it spontaneously ceased after parturition. She did not have a vitamin deficiency, metabolic abnormality, or any other medical problems. We considered that there might have been a different mechanism underlying the continual ictal activity and pharmacoresistance, such as eclampsia. The precise etiopathogenesis of convulsions in eclampsia remains obscure, but recent studies have suggested that a different mechanism other than hypertension or cerebral edema can cause seizures in eclampsia. Neurotransmitters, such as neurokinin B and the proinflammatory cytokines, TNF- α , IL-6, and IL-10, can excite NMDA glutamatergic receptors, and they play an important role in increasing neuronal excitability. They were reported to be increased in patients with eclampsia. Increased tissue plasminogen activator (t-PA), which activates excitatory receptors, may enhance epileptogenesis [7]. Nevertheless, our patient showed no signs of eclampsia or hormonal and neuromodulatory changes during pregnancy that might have contributed to the development of RSE. Unfortunately, the patient's gestational age was too early for labor in our case, and so we had to wait, even though the best way to control eclampsia is with parturition as soon as possible. After parturition, the RSE of our patient was controlled immediately.

Above all, SE in the pregnant state is usually unpredictable and unpreventable. Thus, pregnancy in women with epilepsy needs to be well planned with stratified levels of management. In addition, parturition may be beneficial and the best treatment option in pregnant patients with RSE.

References

1. Brodtkorb E, Reimers A. Seizure control and pharmacokinetics of antiepileptic drugs in pregnant women with epilepsy. *Seizure* 2008; 17:160-5.
2. Schulze-Bonhage A, Kurthen M, Walger P, Elger CE. Pharmacorefractory status epilepticus due to low vitamin B6 levels during pregnancy. *Epilepsia* 2004;45:81-4.
3. Aladdin Y, Gross DW. Refractory status epilepticus during pregnancy secondary to cavernous angioma. *Epilepsia* 2008;49:1627-9.
4. Harden CL, Hopp J, Ting TY, et al. Practice Parameter update: Management issues for women with Epilepsy-Focus on pregnancy (an evidence-based review): Obstetrical complications and change in seizure frequency: report of the Quality Standards Subcommittee and Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology and American Epilepsy Society. *Neurology* 2009;73:126-32.
5. Kaplan PW, Norwitz ER, Ben-Menachem E, et al. Obstetric risk for women with epilepsy during pregnancy. *Epilepsy Behav* 2007;11:283-91.
6. Otani K. Risk factors for the increased seizure frequency during pregnancy and puerperium. *Folia Psychiatr Neurol Jpn* 1985;39:33-41.
7. Wasseff S. Mechanisms of convulsions in eclampsia. *Med Hypotheses* 2009;72:49-51.