

# Seizures Related to Two-child Policy: A Case Report

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**Abstract:** From 1979 to 2012, the Chinese government implemented the one-child policy to control population growth. In 2013, families in which either parent was the only one child were allowed to apply for a second child. In 2016, China's universal two-child policy was finally imposed. As such, many children who had always been the center of their family's universe due to the unique family structure stemming from the one-child policy era became elder siblings during their adolescence. We report a case of a 9-year-old girl who developed seizures after the birth of her younger sister. The combination of clinical observation, laboratory examinations, and video-electroencephalography was not enough to make a confident diagnosis of epilepsy initially. Given her patient history and follow-up investigation, we speculated the two-child policy was related to her seizures. To our knowledge, this is the first report of seizures strongly related to the two-child policy.

**Key words** seizure, two-child policy, epilepsy, psychogenic nonepileptic seizures (PNES).

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## INTRODUCTION

Though controversial, China's universal two-child policy was finally imposed after its 36 years' one-child policy. Thus, many children, who were used to being the center of their family's attention due to the unique family structure resulting from the one-child policy, become elder brothers or sisters during puberty. Many problems have been arising. But when it comes to epilepsy or its psychiatric comorbidities, none have taken fertility policy into consideration. This study is a report of seizures related to the two-child policy.

## CASE HISTORY

The patient is a 9-year-old right-handed girl. She had always lived with her parents until the implement of two-child policy, when her parents decided to have a second child. After the birth of her sister, the patient was sent to her grandparents' home while her sister remained with her parents. The occasional visits from her parents stopped when her 10-month-old sister was hospitalized for injury, and she instead went to visit her sister and parents. During her visit, the TV of her sister's ward was playing an

educational film of epilepsy. The following day when she was back at her grandparents' house, she began having paroxysmal seizures. Each time the seizures started as she was lying awake in bed. The forms of her seizures were alterable. Sometimes she writhed her limbs, other times it appeared to be typical generalized tonic-clonic seizure, but sometimes her head moved from side to side following sound stimulation. The frequency also increased from several times a week with her parents to nearly twice a day with her grandparents. In addition, the duration of seizures changed from several seconds with her parents to several minutes and even ten minutes with her grandparents.

The patient had seizures every one or two days at the time of presentation to our hospital with her parents. Magnetic resonance imaging (MRI) scans of the brain were normal (Figure 1). Lumbar puncture suggested normal glucose and CSF protein and no white blood cells. Cognitive functions were normal. There were no reports of abuse or epilepsy history. She had no seizures during the 16-hour video-electroencephalography (v-EEG) recording. The v-EEG showed sporadic spikes or sharp wave complexes in the right hemisphere

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(Figure 2). Despite the non-typical EEG, we noted the possible comorbidity with psychiatric conditions. After the integration of suggestible dialogue and hinted vitamin C treatment (as placebo), she only had one seizure the next week. From then on, the patients' parents tried to balance the time between both children. The patient still had generalized tonic-clonic seizures about once a week during follow-up, but the duration was regular and had shortened to several seconds. Two months later, she came to our epilepsy clinic with her parents and was started on oxcarbazepine. As of this time, she has been seizure-free for two months.

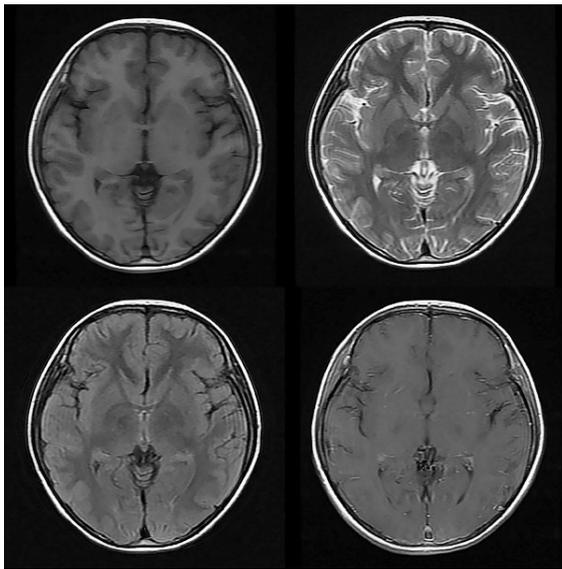


Figure 1 MR and enhanced MR imaging showing no obvious abnormality.



Figure 2 EEG showing sporadic spike or sharp wave complexes in the right hemisphere.

## DISCUSSION

One of the diagnostic considerations when a young female patient presents with seizures is psychogenic

nonepileptic seizures (PNES)<sup>[1-4]</sup>. Making the diagnosis of PNES is quite challenging<sup>[5,6]</sup>. The diagnostic determination on PNES should be based on the combination of detailed patient history, clinician observations, witness reports, and ictal and interictal EEG and ictal video<sup>[7]</sup>. Furthermore, assessment of how a patient describes their symptoms and interacts with an interviewer is valuable<sup>[8]</sup>.

In our case, the patient had motor manifestations such as writhing and side-to-side head movements that often occur in PNES<sup>[8,9]</sup>. Additionally, we noted witness reports that the patient experienced more severe seizures in the absence of her parents. Though the v-EEG showed sporadic spikes or sharp wave complexes, there were no corresponding seizures recorded. It should be observed that  $\approx 0.5\%$  of healthy people show epileptiform discharges<sup>[10]</sup>.

The main reported factors associated with PNES in children include academic difficulties, bullying, stressful family environment, interpersonal conflict, and physical/sexual abuse<sup>[1,2]</sup>. However, none have assessed the effect of the fertility policy on seizures. Though controversial, the one-child policy had been implemented for 36 years by the Chinese government to control the baby boom<sup>[11,12]</sup>. There is also debate about the indirect impact of the one-child policy. Some blame the one-child policy for the phenomenon of parents and grandparents spoiling the only child, creating obese, self-centered, and unsociable "little emperors"<sup>[12,13]</sup>. Now with the introduction of the universal two-child policy since 2016<sup>[11]</sup>, many families would have a second child in the first child's adolescence. The first child, on the other hand, had been the center of the family's attention due to the one-child policy. Being that adolescence is a sensitive period for PNES<sup>[7]</sup>, the effect of the two-child policy on seizures cannot be ignored.

In our case, the 9-year-old patient had a sister after the implementation of the two-child policy, before which she had never expected a younger sister. Her parents reported her being unhappy after being sent to her grandparents' home. Such issues arise often when parents struggle to raise two children simultaneously and turn to grandparents for help. The onset time of her

seizures was also associated with her sister. Given her patient history, we speculated that her seizures were related to psychiatric conditions. Later suggestible treatment also confirmed this.

Though her follow-up seizures and the effectiveness of oxcarbazepine suggest the diagnosis of epilepsy, the psychiatric comorbidity related to the two-child policy also begs attention. In our case, the diagnosis was initially unclear because of the patient's onset time, the variable nature of her seizures, the long duration, the occurrence during pseudosleep, the nontypical v-EEG, and the effectiveness of hinted treatment. Realizing the unignorable psychiatric impact of two-child policy, we completed a two-month follow-up observation while the patient received her parents' company as her sister did. The stabilization and reduction of seizures gave us further proof of psychiatric comorbidity related to the two-child policy, and unlike before, her seizures began to show repetitive and stereotypical nature with short duration. We could now make an appropriate diagnosis of epilepsy and give her oxcarbazepine for treatment. This case brings attention to the psychiatric effect of the two-child policy and its interference with the diagnosis of epilepsy. Despite the criticism, the two-child policy is still in effect in China. There has been research on the medical risks affecting obstetrics after the implementation of the two-child policy<sup>[14,15]</sup>. However, when it comes to epilepsy, few have taken the two-child policy into consideration. To our knowledge, this is the first report of seizures strongly related to the two-child policy.

There are confounding factors in this case. More research is needed to minimize confounding factors like the left-behind children issue. Future research with large sample sizes is needed to determine how closely seizures and the two-child policy are related.

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