Landau-Kleffner Syndrome Beginning With Stuttering: Case Report
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What is This?
Landau-Kleffner Syndrome Beginning With Stuttering: Case Report

ABSTRACT

Landau-Kleffner syndrome is marked by an acquired aphasia in children who have had normal language and motor development. A 3.5-year-old girl referred to our clinic with stuttering. She was diagnosed as having benign myoclonic epilepsy of infancy at 3.5 months of age and treated with valproic acid. Her electroencephalogram (EEG) returned to normal at the end of the first year. The therapy was stopped after a 2-year seizure-free period. Her EEG was normal at that time. She started to stutter 3 months after the discontinuation of antiepilepsy drugs when she was 39 months old. She was stuttering prominently, but she could understand well. She had no verbal agnosia. Her EEG occurred at the end of the second month (Figure 2B). Her speech improved remarkably. She was only elongating the first sounds of the words rarely. Her speech was completely normal at the end of 3.5 months. Gradually, discontinuation of valproate was planned. She is still on clobazam therapy.

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Landau-Kleffner syndrome was described in 1957 in 6 children; since its first description, almost 200 cases have been reported. It is marked by an acquired aphasia in children who have had normal language and motor development. Boys appear to be more affected, in an approximate ratio of 2 to 1. The etiology of this syndrome is unknown. Landau-Kleffner postulated that the aphasia might be caused by a functional ablation of the primary cortical language areas by the persistent convulsive discharges. The possibility of focal, subacute encephalitis has been suggested. Symptoms develop between 4 and 7 years of age. Aphasia is the first manifestation of the syndrome in about half of the cases. Clinical seizures occur in about 70 to 80% of the cases. Both generalized and partial seizures have been reported, but complex partial seizures and generalized tonic-clonic seizures occur most frequently. The prognosis is variable, without any constant relationship between the seizure disorder and electroencephalographic (EEG) abnormalities and aphasia.

In this report, a 3.5-year-old girl diagnosed as having Landau-Kleffner syndrome with expressive aphasia is presented.

Case Report

A 3.5-year-old girl referred to our clinic first at the age of 3.5 months because of myoclonic seizures. Her neurologic examination and development were normal. In sleep, EEG background activity was normal. Diffuse high-voltage spike-and-wave and multiple spike-and-wave discharges with brief duration (4–5 seconds) were observed (Figure 1). Cranial magnetic resonance imaging (MRI) was normal. She was diagnosed as having benign myoclonic epilepsy of infancy. Valproic acid was started, and corticosteroid (ACTH) was added when myoclonic seizures persisted. Her seizures were easily controlled, and her EEG returned to normal at the end of the first year. The therapy was stopped 2 years after a seizure-free period. Her EEG was normal at that time. She started to stutter 3 months after the discontinuation of antiepilepsy drugs when she was 39 months old. She was stuttering prominently, but she could understand well. She had no verbal agnosia. Her sleep EEG revealed multiple spike-and-wave discharges (250 µV and 2–2.5 cycles/s) on the left temporocentral and frontal regions. Background activity was normal (Figure 2A).

She was a term baby born by normal vaginal delivery. Her developmental history was normal, and she was able to speak fluently from the age of 2 years. She had been followed up in the Child Neurology Department. The Denver Developmental Screening Test-Revised was performed when she was 12 months old and 2.5 years old, and she was assessed as normal. Language development was normal before she started to stutter. She could play with her toys and friends. She could control a game and play in a group. She could tell stories and talk about games and activities she had done to her mother. She could use prepositions for time and position; for example, she could say, “We are playing in the garden” or “I want to go to grandmother’s home when dad comes at night.” Her family history was unremarkable.

Her weight, height and head circumference was 14.5 kg (50th percentile), 100 cm (50th percentile), 48.5 cm (2nd to 50th percentile), respectively. Her physical and neurologic examinations were normal except for expressive dysphasia. Her cranial MRI was normal. Valproic acid was started again and continued at a dose of 25 mg/kg/day. Intravenous immunoglobulin was used 400 mg/kg/day for 5 consecutive days. She was also given ACTH 50 U/day for 3 days/week for 4 weeks and 2 days/week for 4 weeks, followed by gradual reduction of the dose. Her speech started to recover after ACTH and intravenous immunoglobulin therapy. Clobazam was added to therapy at a dose of 5 mg/day after ACTH. Full recovery of EEG occurred at the end of the second month (Figure 2B). Her speech improved remarkably. She was only elongating the first sounds of the words rarely. Her speech was completely normal at the end of 3.5 months. Gradually, discontinuation of valproate was planned. She is still on clobazam therapy.

Discussion

Landau-Kleffner syndrome is an acquired aphasia that begins in childhood and is thought to arise from an epilepsy disorder within
the auditory speech cortex. The neurology of stuttering is fascinating. The notion that stuttering is the result of left hemispheric dysfunction is supported by positron emission tomographic studies.

This syndrome is an unclassified epilepsy syndrome, whether generalized or partial. Our case had generalized epilepsy previously. Although a variety of seizures accompany Landau-Kleffner syndrome in approximately 80% of the cases, our case did not have an epileptic seizure at the time.

The seizures reported with Landau-Kleffner syndrome are usually complex partial, generalized tonic clonic, and atonic. Tonic and myoclonic seizures are rare. Our case had had myoclonic seizures previously.

In typical Landau-Kleffner syndrome, the defect of language function is usually a verbal-auditory agnosia with an inability to understand language. Receptive dysfunction seems to dominate the early stage of this disorder. Expressive deficits develop later. It is reported that less than 10% of the aphasia is initially predominantly expressive. Our case was initially the expressive type.

The importance of this case for us was the development of Landau-Kleffner syndrome after the treatment of generalized epilepsy and expressive dysfunction at the beginning.

In a review of 45 reported cases followed to at least age 12 years, Bishop reported that prognosis correlated to a certain degree with the age of onset. The patients affected before the age of 5 years had poorer outcome for language recovery than the cases affected later. But other studies did not confirm a relationship between the age of onset and the long-term prognosis.

Soprano et al followed 12 cases for a mean of 8 years. The 3 patients with persistent EEG abnormalities did not show any language recovery. Among the 9 patients whose EEG became normal, only 3 had a complete language recovery. But language skills and EEG abnormalities were both recovered in our case.

The treatment of Landau-Kleffner syndrome is on a trial basis. Clobazam, nitrazepam, valproic acid, sulfisoximide have been tried, with benefits. Phenobarbital, carbamazepine, and phenytoin have been reported to be ineffective or harmful. Corticosteroids seem to be effective. In the literature, there are patients successfully treated with high-dose intravenous corticosteroids. The authors reported that rapid improvement in speech ability was achieved with corticosteroids.

There are also reports of successful use of intravenous immunoglobulin. It was presented that both language functions and EEG abnormalities were influenced significantly by intravenous immunoglobulin treatment.

Our case also benefitted from ACTH and intravenous immunoglobulin therapy. Prominent recovery of speech and normalization of EEG occurred 2 months after starting ACTH therapy. Her speech was completely normal 3.5 months after the beginning of the symptoms. This case is very important with respect to the development of Landau-Kleffner syndrome following the known generalized epilepsy. Her first symptom was only stuttering, which could easily be evaluated as simple stuttering for her age. Her previous epilepsy history caused her to obtain an EEG in the early period. We suggest that if a child with normal language function starts to stutter, Landau-Kleffner syndrome must be considered in the differential diagnosis.

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References


Subacute sclerosing panencephalitis is a rare encephalopathy caused by a persistent measles virus infection. We examined a 13-year-old girl with subacute sclerosing panencephalitis and performed a magnetic resonance spectroscopic study to evaluate the in vivo pathophysiologic abnormality. The results suggested the occurrence of inflammatory processes and glial proliferation prior to neuronal loss even in magnetic resonance imaging (MRI)-negative regions as well as in MRI-positive regions. The additional resonance peaks were also detected, but further studies should be performed to determine the precise pathophysiologic mechanisms. Novel in vivo modalities such as spectroscopy would be useful as a tool to measure responses to therapy. (J Child Neurol 2002;17:788–790).

**Proton Magnetic Resonance Spectroscopy in a Case of Subacute Sclerosing Panencephalitis**

**ABSTRACT**

Subacute sclerosing panencephalitis is an encephalopathy caused by a persistent measles virus infection. We examined a 13-year-old girl with subacute sclerosing panencephalitis and performed a magnetic resonance spectroscopic study to evaluate the in vivo pathophysiologic abnormality. The results suggested the occurrence of inflammatory processes and glial proliferation prior to neuronal loss even in magnetic resonance imaging (MRI)-negative regions as well as in MRI-positive regions. The additional resonance peaks were also detected, but further studies should be performed to determine the precise pathophysiologic mechanisms. Novel in vivo modalities such as spectroscopy would be useful as a tool to measure responses to therapy. (J Child Neurol 2002;17:788–790).

**Discussion**

Currently, there is only one report on magnetic resonance spectroscopy of a patient with subacute sclerosing panencephalitis, and the authors described findings such as a decrease in N-acetylaspartate resonance and an increase in myo-inositol, choline, and lactate resonances in the MRI-positive region. A N-acetylaspartate resonance is proven to be within the bodies of neurons, and the decrease can be thought of as neuronal loss. Myo-inositol is exclusively located in astrocytes as an osmolyte, and the increase of myo-inositol suggests glial proliferation. Choline peak is mainly from the sum of phosphorylcholine, glycerophosphorylcholine, and free choline, but phosphorylcholine, the major part of choline in myelin, is invisible in magnetic resonance spectroscopy in normal state. The increase of choline in many pathologic circumstances such as inflammation or demyelination can be thought of as release from the invisible choline pool. The increase in lactate resonance indicates ischemia or acceleration of glycolysis. The authors interpreted the increase of lactate in their patient as macrophagic infiltration rather than ischemia because of the lack of edematous change in MRI in the study. The magnetic resonance spectroscopic study in the apparently normal region by MRI showed an increase in choline and myo-inositol resonances. They suggested the occurrence of inflammatory processes and glial proliferation prior to neuronal loss even in MRI-negative regions.

Our study showed mainly the same features as those observed in the previous study, except for the decrease in N-acetylaspartate resonance and the presence of lactate resonance even in the MRI-negative region (see Figure 2). The patient of Salvan et al had a rel-