INTRODUCTION

Epilepsy and migraine are comorbidities with a bidirectional increased risk of morbidity. There is “headache attributed to epilepsy” as a secondary headache, and “migraine aura-triggered seizure” as a very rare complication of migraine that must be differentiated from occipital lobe epilepsy. Lomerizine hydrochloride (lomerizine) was developed as an analog of flunarizine hydrochloride (flunarizine). As compared to flunarizine, lomerizine is known to cause extrapyramidal side effects less frequently despite its blood–brain barrier (BBB)-permeant nature. Lomerizine has a recommendation as one of the first-line drugs for migraine prevention in the Clinical Practice Guideline for Headache Disorders 2021. We report a case of migraine complicated with epilepsy who was successfully treated with lomerizine.

A 29-year-old woman visited our hospital complaining of unusual headaches. The prodromal symptoms changed from typical scintillating scotoma to short-lasting moving lights against deja-vu scenery. Then, loss of consciousness and urinary incontinence after headaches, and even generalized convulsion began to occur. Lomerizine hydrochloride decreased her headache attacks, urinary incontinence, loss of consciousness, and seizure. We considered her headache changed from migraine with typical aura to post-ictal headache. Lomerizine hydrochloride may have alleviated epilepsy in addition to migraine.

KEYWORDS
epilepsy, lomerizine hydrochloride, migraine aura-triggered seizure, migraine with aura, post-ictal headache

CASE REPORT

Pathophysiological crosstalk between migraine aura and epilepsy: Effect of lomerizine hydrochloride

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Abstract
A 29-year-old woman previously diagnosed with both migraine with aura and epilepsy visited our hospital complaining of unusual headaches. The prodromal symptoms changed from typical scintillating scotoma to short-lasting moving lights against deja-vu scenery. Then, loss of consciousness and urinary incontinence after headaches, and even generalized convulsion began to occur. Lomerizine hydrochloride decreased her headache attacks, urinary incontinence, loss of consciousness, and seizure. We considered her headache changed from migraine with typical aura to post-ictal headache. Lomerizine hydrochloride may have alleviated epilepsy in addition to migraine.

1 | INTRODUCTION

When she was 17 years old, she began to have attacks of pulsating headaches with nausea, vomiting, and photophobia, which were preceded by spreading scintillating scotoma lasting for 20 minutes. Visual aura was sometimes followed by short-lasting aphasia. Thereafter, a neurologist diagnosed her with migraine with typical aura, and she started taking triptan, which relieved the severity of the headaches. In her early 20’s, the pattern of prodromal symptoms before the headache changed into repeatedly appearing lightning images against the specific deja-vu scenery for 1–2 minutes. Moreover, she noticed that her eyes were pulled upward diagonally toward the direction of the visual image. What she wrote and talked during the prodrome, and headache did not make sense. Repeated cranial magnetic resonance imaging and electroencephalogram (EEG) were normal. When she was 25 years old, she began to develop loss of consciousness and urinary incontinence preceded by the usual visual and verbal symptoms. Syncope or convulsion occurred once every 2 or 3 months. She then

Received: 1 August 2022 | Revised: 16 August 2022 | Accepted: 18 August 2022
DOI: 10.1111/ncn3.12663

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visited our hospital. The previously independent attacks of epilepsy and migraine with aura seemed to have converted into a single series of symptoms. The nature of her headaches remained unchanged, even after the prodromal visual symptoms had transformed. The provisional diagnosis at the initial visit was "migraine aura-triggered seizure" according to the International Classification of Headache Disorders, 3rd edition. Lomerizine 20 mg daily was added on since she was already taking valproic acid 600 mg daily. EEG showed paroxysmal slow waves predominantly in the bilateral parietal to occipital regions after photic stimulation and before hyperventilation (Figure 1). Her headache developed soon after visual and verbal changes and terminated after sleep for about 8 hours. Considering clinical findings, her headache was thought to have changed from migraine with typical aura to post-ictal headache with the focus in the occipital lobe. Two months after lomerizine administration, the headaches were relieved in severity and decreased in frequency from once to several a month. Nausea, headaches accompanying urinary incontinence, and tonic seizures disappeared. During the 20 months of lomerizine administration, she lost consciousness only once.

This case suggests that the symptoms of migraine and epilepsy may modify each other. Pathophysiologically, migraine and epilepsy attacks do not occur simultaneously, but our patient suggested that they may occur sequentially. Both migraine and epilepsy are associated with brain hyperexcitability, with migraine being initiated by cortical spreading depression (CSD). Seizures may trigger trigeminovascular pain mechanisms, as migraine is triggered by CSD. The central sensitization theory of migraine proposes altered processing of sensory input in the brainstem, principally the trigeminal nucleus caudalis. Such a mechanism seems to be operative also in headache in epilepsy. Lomerizine may have been effective both for migraine and epilepsy for this patient. Lomerizine inhibits cortical hypoperfusion and expression of c-Fos-like immunoreactivity induced by spreading depression in rats. Lomerizine may inhibit CSD in migraine. Moreover, flunarizine was reported to have some effect on the treatment of epilepsy. There are migraineurs with epilepsy whose epilepsy does not improve after starting lomerizine, which reflects the heterogeneity of epilepsy pathogenesis. The reason that lomerizine was effective in this patient was thought to be that there existed a common pathway shared by her migraine attacks and epilepsy. Migraine and epilepsy may involve mutual crosstalk. Lomerizine may have the efficacy of alleviating epilepsy in addition to migraine.

ACKNOWLEDGMENT
None.

CONFLICT OF INTEREST
None.

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How to cite this article: Fujita K, Shibata M, Maruki Y, Sakai F. Pathophysiological crosstalk between migraine aura and epilepsy: Effect of lomerizine hydrochloride. *Neurol Clin Neurosci*. 2022;10:318-320. doi: [10.1111/ncn3.12663](https://doi.org/10.1111/ncn3.12663)