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Case Report

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Gabapentin Treatment Resulting in New-Onset Stuttering: A Case Report and Literature Review

Evan Zeldin[1], Michael Byrd[2], William Barfield[3], Emily Darr[3]

1 *East Carolina University Department of Physical Medicine and Rehabilitation, 604 Medical Drive Greenville, NC 27834, USA*

2 *Medical University of South Carolina College of Medicine. 96 Jonathan Lucas Street Suite 601, Charleston, SC 29425, USA*

3 *Medical University of South Carolina Department of Orthopaedics & Physical Medicine. 96 Jonathan Lucas Street Suite 708, Charleston, SC 29425, USA*

Abstract

This case describes a 62-year-old male with chronic low back and leg pain in the setting of worsening degenerative disk disease and lumbar spondylosis. Gabapentin is FDA approved for the treatment of post-herpetic neuralgia and as an adjunctive therapy for partial onset seizures, but is commonly used off-label for neuropathic pain. The patient was treated with three doses of gabapentin 300mg and a total of 44mg of methylprednisolone over a two-day period. The patient had previously tolerated methylprednisolone with no side effects and was not receiving any other acutely prescribed medications. The patient took ibuprofen chronically as needed for the pain. Subsequently, the patient acquired new-onset stuttering which resolved with gabapentin discontinuation. A CT of the brain performed subsequently showed no acute changes. A neurological and physical examination following showed no changes except for the stuttering. This was the first time the patient had taken gabapentin. To the best knowledge of the researchers, this is only the second reported case of stuttering induced by gabapentin. This case report seeks to educate physicians on a possible side effect of gabapentin, a commonly used medication.

Keywords: Antiepileptic drugs, Stuttering, All Pain, All Rehabilitation, Disc disease.

INTRODUCTION

Gabapentin is FDA approved for the treatment of postherpetic neuralgia and as an adjunctive therapy for partial onset seizures, and is also used for a wide variety of treatments including neuropathic pain, fibromyalgia, and alcohol withdrawal. Gabapentin works by binding to the subunits of voltage-gated Ca2+ channels which depress signal transmission in nociceptive pathways [1]. Clinical studies have also shown that gabapentin is an effective treatment of neuropathic pain with minimal side effects compared to other medications, such as the tricyclic antidepressants [2]. Common side effects of gabapentin are dizziness, drowsiness, headache, diarrhea, weight gain, and peripheral edema [3].

Stuttering is a disorder of speech characterized by the involuntary repetition of syllables, words, or phrases. Psychiatry medications that have caused stuttering in case reports and series include SSRIs (sertraline, fluoxetine) [4,5], stimulants (methylphenidate) [5], and antipsychotics (olanzapine, clozapine, risperidone) [5–7]. A case report from 1997 demonstrated that a patient started on gabapentin developed stuttering following the initiation of gabapentin for seizures [8]. In this report, the stuttering resolved four days after the medication was discontinued. The report did not specify the dose or frequency.

CASE REPORT

The patient is a 62-year-old male who presented with worsening chronic low back and leg pain in the setting of worsening degenerative disk disease and lumbar spondylosis focused at the L4-L5 level. The patient had no prior history of conversion disorder or other psychiatric disorder. The current pain was located deep in the lumbar region in a belt-like distribution with occasional pain radiating into the buttocks and lateral thighs and is worsened with standing and prolonged walking. The patient's physical exam demonstrated bilateral lumbar tenderness as well as a reproduction of pain with facet loading. There was no focal weakness and a negative straight leg test bilaterally. The neurological exam showed paraspinal atrophy and weakness. The patient was started on a methylprednisolone taper with initial dosing of 24mg for the first

***Corresponding author:**
Evan Zeldin
East Carolina University Department of Physical Medicine and Rehabilitation, 604 Medical Drive Greenville, NC 27834, USA
Email: evan.zeldin@gmail.com

day and 20mg for the second day as well as gabapentin 300mg three times daily with plans for titration over three days.

Two days later, the patient experienced an acute onset of stuttering. The patient had no prior history of stuttering, speech deficit, seizure, or cerebral ischemic event. The stuttering began 20 minutes after taking his third dose of 300 mg gabapentin and lasted approximately 6 hours. The next morning he had normal fluency; however, after only a few sentences, his stuttering resumed. The patient presented to the emergency department for concern of stroke. An acute CT was performed with no abnormal findings. The following day, the patient presented to the neurology clinic for further evaluation. A complete physical and neurological exam was performed showing no deficits with the exception of the stuttering. The gabapentin was discontinued and the patient was told to follow-up if the stuttering did not resolve. Upon discontinuation of the medication, the stuttering began to immediately dissipate in frequency and severity, but still existed at the neurology visit 10 days following initial incident. Repeat physical exam and a repeat head CT showed no abnormalities. The stuttering completely resolved within a few weeks of discontinuation of the gabapentin and has not resumed.

DISCUSSION

In this report, a patient with no prior history of dysfluency, conversion disorder, or other psychiatric history developed stuttering after being started on a new medication, gabapentin. The only other medication that was initiated at that time was methylprednisolone, which the patient had taken previously with no adverse effects. Additionally, upon discontinuation of gabapentin, the frequency and severity of the stuttering began to diminish. Furthermore, this is not the first reported case of this adverse effect in the literature. These findings suggest gabapentin as the likely cause of the new-onset stuttering.

Gabapentin is a commonly used medication to treat the symptoms of neuropathic pain, not only for its efficacy, but also due to the perceived low-risk compared to other anticonvulsants. However, there are isolated case reports reporting a variety of adverse effects from the medication, such as withdrawal seizures [9] and leukopenia [10]. The complication of stuttering as a result of gabapentin use has only been reported once in the literature to our knowledge. Therefore, stuttering in response to gabapentin could be considered a Type B adverse drug reaction [11]; however, a clinical trial linking the mechanism of action of gabapentin with the pathophysiology of stuttering could confirm this statement. No clinical trials linking the mechanism of action of gabapentin with stuttering were identified in the literature. The underlying pathophysiology of stuttering is not fully understood. Hyperactivity of the right hemispheric brain, abnormal coordination between speech planning and execution centers, and dopamine dysregulation are thought to contribute [12]. Gabapentin may be causing dopamine dysregulation in the striatum leading to white matter tract dysfunction between the motor cortex and Broca's area which is responsible for the motor function of speech [13, 14, 15]. Evidence shows the left caudate is specialized in speech production, and that the left caudate has connections to Broca's area while the right caudate does not have direct connections [15]. Other reports have shown Gabapentin to cause chorea, which is thought to occur when the basal ganglia are deregulated [16]. On the contrary, Gabapentin has also been used to treat neurogenic stuttering [17]. Gabapentin appears to be a drug that may provoke or reduce stuttering, pointing to multiple interacting neurotransmitter systems [18]. Pregabalin, another GABA analogue, has also induced stuttering [13], so this side effect may be a class effect of GABA analogues. Providers prescribing gabapentin and other GABA analogues should be aware of the potential for wide-ranging and abnormal adverse effects.

CONCLUSION

Gabapentin is a commonly used medication that can cause adverse neurologic effects. Patients taking gabapentin or other medications in the class should be monitored to watch for potential neurological adverse effects.

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