

Successful Treatment of Hallucinations Associated With Sensory Impairment Using Gabapentin

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Sensory impairment hallucinations, such as visual hallucinations with visual loss, may not respond to traditional treatments such as antipsychotics. In this case series, the authors describe four patients with either visual or musical hallucinations associated with sensory impairment who were successfully treated with gabapentin.

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Hallucinations related to sensory deprivation include visual hallucinations with visual impairment and musical hallucinations with auditory impairment. In studies of those with visual disorders, 6.3%–13% report visual hallucinations, often beginning with a sudden decrease in vision.^{1–3} Studies of comparison subjects undergoing visual sensory deprivation reveal that 19%–77% develop visual hallucinations, highlighting the role of sensory deprivation in the development of visual hallucinations.⁴

Older age is associated with sensory deprivation hallucinations. A study of ophthalmology patients ages 14 to 95 revealed that older age is associated with visual hallucinations, with no patient under age 60 reporting visual hallucinations.² However, a study of comparison subjects who experienced visual hallucinations due to imposed sensory deprivation had a mean age of 25, suggesting that rapid and complete visual deprivation is sufficient to induce visual hallucinations independent of age.⁴ In addition, there is a report of two children with rapid visual loss developing visual hallucinations.⁵ All musical hallucinations reported in the literature had onset after age 60.^{6–8}

Hallucinations associated with sensory deprivation have characteristic features. Visual hallucinations may

be geometric patterns (bricks, lattice), animals, or people. They tend to be short in duration (seconds or minutes), silent, and occur more in dim light. Patients may stop the visual hallucinations by closing or moving their eyes or by increasing the light. Visual hallucinations typically begin suddenly, often with worsening vision.^{1,2,9} In contrast to visual hallucinations, musical hallucinations are continuous rather than lasting just a short while and tend to appear in the setting of chronic deafness rather than during a sudden change in hearing.⁷ Interestingly, musical hallucinations may be either choral or instrumental. The majority of visual hallucinations resolve spontaneously or with treatment of the underlying visual disorder (e.g., removal of cataracts), but some cases are chronic.^{9,10} However, with musical hallucinations, all reported cases are chronic.^{5,7}

It is proposed that sensory deprivation causes decreased input to cortical and subcortical areas, allowing previous visual perceptions into consciousness as “release hallucinations.”^{3,11} An additional hypothesis is that an irritative lesion sends abnormal input to visual processing areas, which are misinterpreted as visual hallucinations.^{1,10} Similarly, sensory deprivation or decreased afferent activity has been proposed as causing musical hallucinations.⁷ It is not understood why the auditory hallucinations in deafness would be musical rather than speech or other sounds.

Because such hallucinations are not always distressing, reassurance to patients that they are not “going crazy” and that the hallucinations are due to eye disease or hearing loss may be all that is needed.^{1,2,12} However, for some the hallucinations are quite distressing, and medication management may be considered. Case report results of treatment with antipsychotics, benzodiazepines, or antidepressants show mixed results.^{8,10,13,14}

Successful case reports exist for anticonvulsant drugs, including one case report each for gabapentin, carbamazepine, and valproate, with the theoretical mecha-

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nism of decreasing abnormal neuronal activity.^{12,13,15} Cisapride has also been reported to be useful in the treatment of visual hallucinations.¹⁶

In this article, we report four cases of hallucinations associated with sensory impairment, three visual hallucinations and one musical hallucination, that responded to gabapentin. To our knowledge, this is the only case of musical hallucinations successfully treated with gabapentin. We also report the only case in the literature of visual hallucinations associated with eye disease in an adult patient under age 60. Approval was obtained by the university investigational review committee.

Case Reports

Subject 1

Ms. A was a 47-year-old woman living in a nursing home because of skeletal malformations that caused disability. She experienced visual hallucinations of fields, mountains, people, animals, and brick buildings as her vision worsened as a result of eye infections, with recent total blindness in one eye and reduced vision in the other (OD 20/400). She had full insight that the hallucinations were not real. Medical workup, including relevant bloodwork and urinalysis, was negative. She was in clear consciousness and her Mini-Mental State Examination (MMSE) score was 28/30. She was diagnosed with hallucinations secondary to a medical condition (reduced eyesight). Because she was distressed, gabapentin, 100 mg h.s., was begun, with some reduction of the visual hallucinations. The dosage was eventually increased to 400 mg, with resolution of the visual hallucinations. She remained free of visual hallucinations for 6 months and then suddenly lost vision in her other eye. Within 1 week she had recurrence of visual hallucinations, this time with rainbow swirls of colors, brick patterns, and mountains, but no animals or people. She reported that she did not mind these visual hallucinations because she missed seeing things now that she was blind, and thus requested that the gabapentin be discontinued. The visual hallucinations continued, now for 6 months.

Subject 2

Ms. B was an 88-year-old woman with glaucoma and bilaterally reduced eyesight, referred for evaluation of a

1-month history of daily visual hallucinations that included children, adults, and "snipers with guns." Although at night she was frightened because of the visual hallucinations, she had partial insight, telling staff that she knew no one was there and thought the hallucinations might be due to eye disease. Workup for delirium was negative. Her MMSE score was 27/30. She was diagnosed with hallucinations due to a medical condition (glaucoma, reduced eyesight) and she was started on gabapentin, 100 mg/day, with resolution of visual hallucinations within 1 week. She remained free of visual hallucinations for 5 months, when she began to notice a "small dark boy" only on the left side of her visual field; she told the staff, "my eyes are seeing things again." A dosage increase of gabapentin to 200 mg/day resolved the visual hallucinations within 1 week, and she remained symptom free for 6 months.

Subject 3

Ms. C was an 84-year-old woman referred for visual hallucinations for 2 weeks, described as a pattern of pink and green flowers on lattice on the walls, especially in dim light. She also saw girls in pink dresses and a man. She could make the visual hallucinations disappear by closing her eyes or turning on extra light. Delirium workup was negative. Medical history was remarkable for diabetic retinopathy with severe bilaterally reduced vision. The patient was in clear consciousness, and her MMSE score was 24/30. She was diagnosed with vascular dementia and hallucinations due to a general medical condition (decreased vision). She was started on gabapentin, 100 mg/day, with resolution of her visual hallucinations within 2 weeks. She has remained symptom free for 12 months.

Subject 4

Ms. D was a 94-year-old woman with a diagnosis of vascular dementia with depression, who had been stable on a treatment of venlafaxine for 3 years, and who experienced the sudden onset of musical hallucinations of "Glory Hallelujah" that was continuous. The patient was very distressed, fearing that she was losing her mind. Medical workup for possible delirium was negative. She was in clear consciousness, and her MMSE score was 20/30 (stable over 3 years). She had decreased hearing bilaterally despite hearing aids. Gabapentin, 100 mg h.s., was started, and the musical hallucinations resolved in 3 days. One month later, gabapentin was discontinued at the patient's request, and the same music

started within 2 days. Restarting the gabapentin regimen ended the hallucinations in 4 days. She remained free of musical hallucinations for 1 year, whereupon the gabapentin was discontinued successfully.

DISCUSSION

Our cases describe hallucinations associated with sensory impairment that were successfully treated with gabapentin. Prior to our report, only one case documented the use of gabapentin for such hallucinations. This is an important treatment option for clinicians, as responses to antipsychotics have been mixed, and atypical antipsychotics may have a less favorable side effect profile. This is also the first report of using gabapentin for musical hallucinations, and ours is the first report of musical hallucinations that did not become chronic.

Gabapentin is generally milder than drugs such as carbamazepine, with fewer side effects, so it may be a good option in an elderly patient. In addition, the dosages required in our patients were on the low side.

Our report is the first documenting visual hallucinations in the setting of decreased vision in an adult patient under age 60. This highlights the role of sensory deprivation, and not just age-related changes, in the formation of visual hallucinations. Since gabapentin is an anticonvulsant, its success in these patients supports the theory that hallucinations may be associated with abnormal or irritative neuronal activity.

Because hallucinations in the elderly can be attributed to a variety of causes (e.g., delirium, dementia, or mood disorder), it is important for visual hallucinations and musical hallucinations to be assessed as to etiology. If the visual hallucinations or musical hallucinations seem associated with sensory deprivation, reassurance to the patient may be all that is needed. However, if a medication is felt necessary, clinicians should consider gabapentin. Further clinical experience in such patients may allow for further understanding of such phenomena.

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