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Musical Hallucinations Treated with Atypical Antipsychotics in a Geriatric Population – A Case Series

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Abstract

Musical hallucinations have been likened to the auditory equivalent of Charles Bonnet Syndrome, which involves complex visual hallucinations, most often in the context of visual impairment. Musical hallucinations frequently take the form of hymns, carols, and show-tunes and are strongly associated with hearing loss, with some studies suggesting a prevalence of 2.5–3.6% in the hearing impaired. Musical hallucinations are typically treated with anticonvulsant and anticholinesterase medications, with some studies having evaluated the efficacy of sedative hypnotics, antipsychotics and antidepressants in various psychiatric and medical subpopulations suggesting a heterogeneous spectrum of causes for this disorder.

We present two cases of musical hallucinations in both a 70-year-old African American female with past psychiatric history of major depressive disorder who developed hymnal auditory hallucinations during an acute medical and psychiatric admission and an 86-year-old Caucasian female, who complained of hearing gospel music with eventual onset of visual hallucinations after a fall at age 80. Our patients were successfully treated in both the inpatient and outpatient settings with atypical antipsychotics.

The presented cases add to the paucity of literature regarding utilization of atypical antipsychotics for treatment of musical hallucinations and demonstrate efficacy to this effect. This study lends further validity to the use of psychopharmacologic agents for novel purposes that have yet to be fully explored.

Introduction

Musical hallucinations have been likened to the auditory equivalent of Charles Bonnet Syndrome, which involves complex visual hallucinations, most often in the context of severe visual impairment.¹ Musical hallucinations involve the development of musical auditory phenomena, often repetitive and with a strong nostalgic quality, in the absence of an external source.^{2,3} Like Charles Bonnet Syndrome, the phenomena are strongly associated with primary sensory loss, in this case hearing, carrying a prevalence of 2.5–3.6% in the hearing impaired with higher prevalence in geriatric versus general populations.^{3,4} Severity may differ from mild and well-tolerable to severely disabling, leading to impaired quality of life, significant distress and comorbid psychiatric illness.

Despite the common connection with auditory impairment, musical hallucinations are also seen in other settings including epilepsy, focal brain lesions, intoxication and acute medical or psychiatric illness.^{5,6,7} Though they also occur in states of acute metabolic derangement and delirium, they more often are seen in patients with intact reality testing and cognitive function.³ The current prevailing theory regarding their etiology relates to hearing impairment causing a release

of typical inhibitory pathways in auditory association cortices leading to erroneous feedback that is ultimately perceived as external sound.⁸ This hypothesis however, does not address the emergence of these symptoms in individuals with intact hearing or in those with underlying medical or psychiatric comorbidity. Ergo, it is likely that the presenting features represent a common outcome of a more heterogeneous group of pathophysiologic mechanisms.

In regards to treatment, there is a wide array of modalities that exist. Acetylcholinesterase inhibitors such as donepezil and antidepressants appear to be the most efficacious pharmacologic agents in the current literature, with some more mild cases even appearing to be able to be treated through reassurance and lifestyle modification alone.^{9,10,11} However, one more recent study by Coehberg et al attempted to explore whether or not certain medications may be more efficacious when used in differing clinical sub-populations based on their primary presenting disease, be it medical or psychiatric. Their findings showed that while the two previously mentioned classes of medications do have higher efficacy than most, other classes such as antipsychotics may be more beneficial in patients exhibiting acute psychotic symptoms.¹² Our study builds on the current literature by presenting two complex patients who were successfully treated with aripiprazole and quetiapine for this reason.

Case I

Our first case involved a 69-year-old African-American female with past medical and psychiatric histories significant for

chronic kidney disease requiring hemodialysis three times per week, type II diabetes mellitus, hypertension, mild left-sided hearing impairment and major depressive disorder, severe, recurrent with melancholic features. Though psychotic symptoms had been noted over the course of her psychiatric history, they had been limited to paranoid ideation regarding hemodialysis staff wanting to harm the patient with no previous occurrence of frank perceptual disturbances. Prior to hospitalization the patient was stable on venlafaxine 225mg daily and mirtazepine 30mg nightly with full remission of symptoms since 2013.

According to medical records the patient had discontinued her medications in the weeks before her admission leading to her having an episode of acute decompensated depression. Thereafter, she suffered profound despondency, decreased oral intake, suicidal ideation, with a plan to end her life through refusal of hemodialysis and vague paranoid ideation involving harm by an unknown person. She was thereby transported to a local area hospital and admitted to the medical floor with psychiatry being consulted for further assessment. Admission lab data and imaging were found to be unremarkable.

On initial psychiatric interview the patient appeared withdrawn and voiced complaints consistent with the aforementioned symptoms, however additionally noted that within the days leading to her being hospitalized she had begun to hear music. The music was described to be a hymn from her childhood, constant and external in nature. She was noted to initially attribute the music to someone playing outside of the room but due to its constancy had insight enough to realize that she was the source.

On admission to the psychiatric unit the patient became increasingly despondent and isolative and continued to experience suicidal

ideation with plans to refuse hemodialysis or nutrition. Refusal of oral intake soon followed. However, with regular visits and encouragement from the patient's daughter she began to accept food and medications with more regularity. Paranoia and auditory disturbance however remained at roughly the same intensity with her musical hallucinations staying at a constant volume and frequency. Venlafaxine was increased from 225mg daily to 300mg and oral aripiprazole was started at 2.5mg for further control of her paranoia and auditory phenomena. Despite increases in her medications, depressive symptoms persisted and in a final effort to provide relief she was started on Methylphenidate 5mg twice daily. Following initiation of Methylphenidate the patient demonstrated a significant improvement within 72hrs, experiencing notable reduction in core presenting symptoms – suicidality, paranoia and social withdrawal. Oral intake continued to improve, as did medical compliance with oral medication and hemodialysis.

However, despite overall affective improvement her musical hallucinations remained. Aripiprazole was thusly increased over the remainder of her hospitalization to a total of 10mg daily. Roughly seven days after the final titration her musical hallucinations began to improve, becoming quieter and subjectively more distant until they finally resolved roughly one and a half weeks post final titration. Ultimately she was discharged after nearly a 1-month stay on the unit with complete resolution of presenting symptomatology that has since been maintained in the outpatient setting.

Case II

Our second case involved an 81-year-old female who carried a history of depression and anxiety, treated for many years by her

family physician with sertraline and alprazolam, but did not have a prior history of psychosis or dementia and during her course was never under suspicion for suffering from delirium. It must also be noted that she did carry a history of mild bilateral hearing impairment that was never reported to be of significant clinical consequence. This patient was noted to have developed musical hallucinations after suffering a fall, with report indicating that she had been walking her dog in an area with a significant drop-off, and ultimately slipped and fell. She had significant injuries, developing cutaneous necrosis requiring a plastic surgery intervention. Head imaging at the time did not demonstrate significant hemorrhage or other structural damage. She developed headaches in the immediate aftermath of the injury, but did not immediately develop psychiatric symptoms. Around one year after the fall, she started to hear gospel music when there was none playing. This phenomenon was not problematic for the patient. In fact, she described it as comforting.

About one year subsequent to the initial musical hallucinations, she developed paranoia and delusions. She developed auditory hallucinations of multiple voices, with negative comments and threats of sexual and physical violence. She had delusions that people were living under her home and she began using the toilet in the dark to prevent them from seeing her. She also had the phone lines removed to keep people from listening to her and developed visual hallucinations of people. The patient's daughter had complained that the patient would get agitated and talk to the voices. She made claims that they were trying to take belongings from her home and making threats to harm the dog.

Initial notes from just after the time of the fall indicated extensive physical injuries but no neurological or psychotic sequelae. Notes from

the next two years indicate anxiety as an ongoing problem, but do not reference any of the psychotic symptoms. A note from the patient's daughter included in the chart from around two years after the accident references hearing voices, not sleeping, acting paranoid and fearful. The family physician at that point started the patient on lithium 150 mg daily. She had some improvement in mood stability but the confusion and auditory hallucinations persisted. The patient's PCP had also uncovered and treated a UTI, which seemed to be exacerbating the symptoms.

The family physician had been gradually decreasing the patient's sertraline dose, and around four years after the accident, sertraline was at 50 mg. She was still on alprazolam 0.5 mg three times daily and lithium 150 mg daily. She had an abnormal neurological exam at that point and was sent to the hospital for evaluation for possible stroke. Records from the emergency room indicate patient had a head CT that showed chronic ischemic changes of mild to moderate severity. There was no indication of stroke, and the patient was diagnosed with Bell's palsy.

A few months after the Bell's palsy, the patient had a trial of going off of lithium. She became more confused, wasn't sleeping, and seemed more depressed. Lithium was restarted and patient was started on quetiapine 50 mg at bedtime. Alprazolam had continued at same dose throughout. Hallucinations of voices were still noted to persist. At this time, she was referred to psychiatry for evaluation and treatment.

At the initial visit, the psychiatrist titrated quetiapine up to 100 mg at bedtime and stopped lithium "due to lack of effect." Subsequent phone note indicates that off of lithium the patient again developed mood instability, this time including agitation. She once again did not sleep for several nights in a row

and paranoia was increased. The psychiatrist restarted lithium at 150 mg daily. Her mood was re-stabilized with the resumption of lithium. Quetiapine was gradually titrated up to 200 mg as patient was noted to improve significantly in terms of paranoia and hallucinations. There was a brief trial of increasing sertraline, but patient seemed to do worse on the higher dose, and so the psychiatrist tapered off of sertraline.

At this point, the patient was on lithium 150 mg daily, alprazolam 0.25 mg in afternoon and 0.5 mg at bedtime, and quetiapine 200 mg at bedtime. She has remained relatively stable on this regimen in terms of mood stability. Mild auditory hallucinations of both music and derogatory voices continue intermittently, but the patient is no longer troubled by the symptoms. Patient has had mild renal impairment, with estimated GFR at 46 mL/min. Lithium remained steady at 0.4 meq/L.

Discussion

Musical hallucinations have been reported since 1846, yet a paucity of strong clinical data exists regarding treatment regimens and their efficacy.¹¹ Recent studies have evaluated several classes of medications and their uses in various clinical populations. As previously mentioned, the study performed by Coebergh et al stratified subgroups of patients based on medical and psychiatric illness and postulated that in the psychiatric groups it appeared that the type of disorder was the most important guide as to the choice of treatment.¹² In our cases the most closely associated symptom was psychosis, thereby the choice to utilize atypical antipsychotics was made for this reason.

Being largely associated with deafferentation phenomena, it is hypothesized that musical hallucinations are evoked through the absence of normal auditory

input, thereby the mechanism by which antipsychotics would provide relief still remains unknown in this context. One author has suggested that it may be possible that antipsychotics restore an underlying aberrant process to baseline function at the neurotransmission level, resulting in remission of symptoms.¹³ In other studies these auditory phenomena typically demonstrate rapid resolution in response to antipsychotic initiation as was seen in our first case. Our second case however demonstrated a much slower and incomplete resolution, similar to what has been seen in a report by Peritogiannis et al.¹³ The difference in symptomatic resolution may suggest differences in either the underlying etiology of the disorder or perhaps the subclass of the medication used.

Though the outcomes in our cases were largely positive and the chronology of drug initiation to symptomatic improvement suggestive of atypical antipsychotics being efficacious in this regard, several arguments must be noted. For example, though our first patient had demonstrated resolution of symptoms nearest to the final increase in her aripiprazole, it cannot be ruled out that her other medications may have had a role. It has been shown previously that antidepressants are quite efficacious in treating musical hallucinations in those suffering from a depressive disorder.¹¹ Thereby, the time from the increase in the patient's venlafaxine to her abatement of symptoms makes the attribution of clinical success solely to her antipsychotic regimen unclear. In our second case however the increase in quetiapine appears to be more clearly associated with the resolution of the patient's symptoms, providing stronger evidence that the increase in dose of her atypical antipsychotic was central to her improvement.

Additionally, given the underlying medical pathology in both patients,

it cannot be ruled out that the resolution of their symptoms was not merely due to the natural course of an unknown underlying medical disease process. It could also be argued that our patient's known hearing impairment may have been a contributor to the development of their perceptual disturbances. However, given the long-standing nature of these findings without previous development of auditory phenomena, they were not considered to be significant contributing factors in these cases. It was also considered as to whether delirium or an underlying neurocognitive disorder may have been at play in the development of both patients' symptoms, however given negative imaging and intact cognitive function in both cases this was also felt to be noncontributory. Therefore, given the chronicity of the development of symptoms to serious medical illness or trauma, and the absence of previous perceptual symptoms in these patients, we posit that the underlying cause of their musical hallucinations was likely due to either vascular or metabolic pathology.

Overall, our cases add to the literature by illustrating musical

hallucination manifestation in two very different scenarios in which multiple psychiatric and medical comorbidities were at play through either metabolic derangement as in the first case or direct head trauma as in the second. These cases provide a window into differentiating the patients' musical phenomena from their primary underlying psychiatric illness. While there are multiple factors at work in both scenarios, the improvement of symptoms with initiation of antipsychotic medications suggests they played a large role in symptomatic improvement.

Conclusion

The presented cases add to the paucity of literature regarding utilization of atypical antipsychotics for treatment of musical hallucinations and demonstrate efficacy to this effect. This study lends further validity to the use of psychopharmacologic agents for novel purposes that have yet to be fully explored.

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