

Auditory Charles Bonnet syndrome: case report

INTRODUCTION

An 81-year-old female attended surgery claiming she could hear people singing hymns in her house. She had a religious upbringing and many of the songs she heard had religious connotations. She stated that she didn't hear any other voices speaking and didn't have any visual hallucinations. There was no concern from the patient or her family about her memory or mood. She had some frontal headaches over the last 3 months and some occasional dizziness. There were no other neurological symptoms apart from a long-term problem with her hearing, requiring hearing aids.

She had a past medical history of atrial fibrillation and three strokes, which affected her speech and limb functioning, but had made a good recovery. Her regular medication included amlodipine, apixaban, atorvastatin, thyroxine, and metoprolol. She was fully independent and lived alone.

On examination she looked well, with no concerns regarding cognitive or psychiatric function. Full neurological examination was normal, except for reduced hearing bilaterally. She was referred to neurology who diagnosed her with Charles Bonnet syndrome.

MUSICAL HALLUCINATIONS

Musical hallucinations are auditory hallucinations experienced by a patient in the absence of an external auditory stimulus.¹ Patients can perceive the music either continuously or intermittently.² In the literature this condition is also reported as Oliver Sacks syndrome, musical ear syndrome, and musical hallucinosis. The first reports on musical hallucinations were published in 1849 and 1846, and the first scientific descriptions in 1900 and 1907.³ They are thought to be under-reported; in a sample of older patients with audiological problems, 2.5% reported musical hallucinations when asked.³ It is likely that these are under-reported because of patients concerned about seeming 'crazy',

or because the hallucinations are not bothersome.²

Interestingly, many famous composers have been reported to have had musical hallucinations. Robert Schumann was said to have incorporated musical hallucinations into his Violin Concerto in D Minor and Bedřich Smetana reported his musical hallucinations were in the form of two male voices in G major.^{3,4} Later on, Smetana developed severe hearing loss, thought to be secondary to syphilis, and experienced further musical hallucinations such as a chord in A's major that can be heard in the last movement of his second string quartet.³

The most commonly accepted predisposing condition for the development of musical hallucinations, in up to 67% of patients, has been shown to be hearing impairment.² The hallucinations have been shown to be more intense when the background noise is low.³ General risk factors include advanced age, social isolation, and female sex (up to 70–80%).²

Aside from a hearing deficit, there have been other neurological and psychiatric conditions reported to cause musical hallucinations. These include:^{3,5}

- psychiatric disorders (obsessive compulsive disorder, depression, schizophrenia);
- medication;
- cerebral lesions (for example, vascular cerebral diseases, tumours, demyelinating disease);
- general brain atrophy;
- epilepsy of the temporal lobe;
- Parkinson's disease;
- infectious process of the central nervous system; and
- withdrawal from intoxication.

Despite many studies, the aetiology is still unclear.⁴ Similar to the classic Charles

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Submitted: 7 January 2019; **Editor's response:**
17 January 2019; **final acceptance:** 31 January
2019.

©British Journal of General Practice 2019;
69: 362–363.

DOI: <https://doi.org/10.3399/bjgp19X704537>

Bonnet syndrome in which patients with impaired sight have visual hallucinations, patients with hearing impairment have musical hallucinations. Many believe that both visual and musical hallucinations represent a release phenomenon, that is, the sensory deprivation stops input into the auditory system causing spontaneous activity to occur.^{2,5} As musical hallucinations are more intense when the surrounding noise is low, they can be interpreted as a deafferentation phenomenon and it has therefore also been suggested that they must exclusively be associated with an inner-ear disease leading to 'a hyperactive state of the ear'.³ Another theory is that, as patients commonly hear familiar songs, musical hallucinations are derived from memory and spontaneously released in the absence of a specific brain stimulus.³ However, the cause for these sporadic memory traces is still unknown.

CLINICAL PRESENTATION

Normally they consist of well-known music to the patient, such as pop or religious songs, and are generally non-psychotic in nature.¹ However, there are some reports of patients hearing unfamiliar songs.² Usually the music is familiar to the patient and the hallucinations are unilateral.^{4,5} Musical hallucinations can occur either acutely or gradually and are commonly perceived as frightening, rather than pleasant.^{3,6} As mentioned earlier, the majority of patients are both cognitively and psychiatrically normal. Therefore they are often not associated with other types of hallucinations or concerns about mood, memory, capacity, or perception.⁵ However, any psychiatric or neurological causes for the hallucinations should be ruled out.

Interestingly, a recent study looking through the literature found that the cause of the musical hallucinations had an impact on the type of music heard.² In patients with an auricular or neurodegenerative cause, the songs heard mainly related back to childhood, for example, religious or cultural songs. Patients with structural lesions commonly heard modern music, for example, country or rock, and patients with psychiatric causes tended to hear more sad or scary music.

MANAGEMENT

For patients with musical hallucinations, the treatment of the underlying cause normally leads to resolution of the symptoms, for example, hearing aids, treating underlying psychiatric disorders, stopping suspected causative medication, and treating epileptic

seizures.⁴ Medications noted to trigger musical hallucinations are antipsychotics (olanzapine and quetiapine), antidepressants (clomipramine), antiepileptic medications (carbamazepine and valproate), and donepezil.⁴

In Charles Bonnet syndrome, treatment of hearing impairment normally leads to resolution of the symptoms.⁶ Where the hearing deficit cannot be rehabilitated, listening to ambient background noise, for example, white noise, nature sounds, and the television, can help improve symptoms. The use of psychotropic drugs rarely helps.⁶

It is worth noting that recent research has suggested that patients with Charles Bonnet syndrome are more at risk of developing Lewy body dementia, and screening for any cognitive impairment should be undertaken regularly.⁶

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Provenance

Freely submitted; externally peer reviewed.

Competing interests

The author has declared no competing interests.

Patient consent

The patient gave consent for publication of this case report.

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