

A 19-Year-Old with Intrusive Loops of Music in His Mind

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A 19-year-old student presented to the student health center with complaints of music that had been recurring in his mind for the past 3 years. He had never previously sought help for this issue, but the demands of college had now overwhelmed his ability to cope. He described the problem as beginning on a particular day in high school. He was listening to the radio as he studied, and suddenly worried that he might not be able to stop thinking about a song that was playing. Thereafter, a part of the song's chorus repeated in his mind over and over. He tried to dismiss it, but it persisted for the rest of the evening.

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The next day, he checked his mind for the loop of music and it started again. Soon the music that he heard in his mind changed to sections of other songs that he had recently heard, or even to songs he remembered hearing in the remote past. This is how the patient described his experience:

It was like a stop sign in my field of vision everywhere I looked. My mind was always split in two. I lived in the real world but was always struggling to stop the loops. It was like watching a TV show with the commercials playing at the same time as the show. I worried the loops would escalate continuously and drown my sense of self. I thought I was going insane. I used all of my willpower and tried to reason, argue, pray, and distract myself but it wouldn't stop.

Over time, he began to experience other frightening symptoms, such as intrusive images of sex and violence that shocked his

conscience. At this time he was taking a heavy load of advanced classes and was socially isolated due to lifelong shyness. He said, "I didn't know what was happening to me, but since it was hidden and I didn't draw attention to myself, I just kept going."

Further discussion with the patient indicated that he attributed the loops of music and other intrusions as a product of his own mind. He did not meet criteria for a psychotic or affective illness. There was no history of suicidal ideation or attempts, nor any mental health treatment whatsoever. Medical history was unremarkable and results of laboratory tests were all within normal limits. He occasionally used alcohol and cannabis socially, but did not meet criteria for a substance use disorder. His family history was positive for significant anxiety in his mother (who had never sought treatment) and major depressive disorder in a maternal uncle.

DIAGNOSIS

Obsessive-Compulsive Disorder Presenting with Musical Obsessions

The patient eventually had a significant reduction of symptoms with sertraline combined with exposure and response prevention (ERP), although over time he did experience bothersome side effects with various selective serotonin reuptake inhibitor (SSRI) medications. Ultimately, he was able to control his symptoms sufficiently with ERP alone, but still experienced worsened symptoms during periods of stress.

DISCUSSION

Music is ubiquitous and has inherently memorable qualities. Most people have had the experience of a loop or snippet of music repeating in their mind. This phenomenon is known as an “earworm” and is usually just a temporary annoyance. Earworms themselves are not part of the criteria for any psychiatric disorder, and the term is not mentioned in the *Diagnostic and Statistical Manual of Mental Disorders*, fifth edition (*DSM-5*).¹ The reason is that if earworms reach a clinical level of severity, they fulfill criteria for musical obsessions. These are akin to other clinical obsessions such as those seen in obsessive-compulsive disorder (OCD), which by definition cause distress and are unwanted, recurrent, intrusive, and elicit compulsive behaviors.¹

Musical obsessions must be differentiated from other intrusive musical symptoms, such as musical

hallucinations, in which there is a lack of insight and belief of external causation. They are also distinct from pseudohallucinations, a term for which there is a lack of consensus regarding its definition but that does not involve compulsive behaviors. Lastly, musical obsessions are distinct from palinacousis, a neurological symptom that involves echoing of a sound after it has been

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heard. In one case, a patient had worsened symptoms when her musical obsessions were misdiagnosed and treated with antipsychotics. She was then switched to an SSRI and had substantial improvement.²

A recent review of published and unpublished cases of musical obsessions found that nearly all of the patients were diagnosed with OCD.³ With regard to the patient presented in this case, the musical obsessions were the presenting symptom of emerging OCD. Although it cannot be certain why he had such a response to the intrusive music, cognitive theory stipulates that obsessions are driven by dysfunctional beliefs related to perfectionism, intolerance of uncertainty, overimportance of and a strict need to control thoughts, inflated responsibility, and overestimation of threat.⁴ The patient in this case demonstrated all of these quali-

ties. The content of the thoughts was less important than his maladaptive interpretation of their significance. In particular, he was extremely invested in being a good student, but the musical obsessions threatened his ability to concentrate. He perceived them as an attack on his self-identity and a threat to his sanity. These fears are more easily seen with the better-known obsessions in OCD, such as those involving sex or violence, which he subsequently did experience as well.

An array of compulsive mental behaviors blossomed with his attempts to cope. As the theoretical basis of ERP explains,⁵ the efforts he made to immediately reduce the anxiety caused by the musical obsessions only increased their strength over time. In fact, these mental compulsions are a form of active harm avoidance, which has been hypothesized as a cause of OCD by triggering further intrusive thoughts. This form of avoidance is a stable trait with a neuroanatomical basis in the striatum, an area highly implicated in OCD and a primary target for deep-brain stimulation therapies for the disorder.⁶ He got caught in a vicious cycle, one which was unknowingly fueled by his own efforts. The words he used to describe his experience are evocative of this, as he once stated that he tried to control the obsessions “like a gambler relentlessly pulling the lever on a slot machine.” It was as if he suffered from an addiction, and newer research continues to uncover the remarkable similarities between OCD and substance use disorders.⁷

Of note, unlike the usual ERP therapy used for obsessions, there

is evidence that distraction and thought-stopping techniques may help reduce musical obsessions to some degree.⁸ There is even evidence that chewing gum can be an effective technique.⁹ This activity is thought to impair the involuntary recollection of an auditory image by occupying articulatory motor processes. These findings highlight the peculiar stickiness of music, and in that regard, recent research has for the first time identified specific cortical pathways devoted exclusively to musical processing.¹⁰ Therefore, musical obsessions may require additional techniques for relief beyond traditional exposure-based methods. Nonetheless, because musical obsessions can precede or occur with other obsessions, care must be exercised to make sure that techniques such as distraction do not become a form of avoidance that undermines the treatment of these other obsessions. Conversely, certain cognitive-defusion techniques, such as singing thoughts or saying them in a cartoon voice, have been found somewhat helpful to reduce the negative impact of intrusive thoughts,¹¹ but may not be indicated for those who suffer from musical obsessions.

CONCLUSION

This case illustrates how musical obsessions can be a presenting symptom of OCD, and how they can resemble the common phenomenon of “earworms.” Despite his suffering and fear, this patient was able to keep his experience hidden from others and continued to excel in school for years. His compulsions were purely mental, so in similar cases clinicians should probe for

such symptoms or else they can be missed. This “hidden” type of OCD has become known as “Pure-O,” as if there are only obsessions (and no compulsions) involved. However, this is a misnomer because there are still compulsions, although they are hidden mental acts rather than observable behaviors such as hand washing. The treatment of choice is cognitive-behavioral therapy, namely ERP. Serotonergic antidepressants are also often used, but they can cause troublesome side effects for many patients.

Further study of earworms and musical obsessions will provide insights into executive functions of the brain, such as attention, memory, imagery, and other areas such as communication and impulse control. These findings will have relevance for the numerous psychiatric illnesses in which intrusive phenomena exist, particularly conditions on the obsessive-compulsive spectrum. They may also improve pedagogical methods, leading to better ways to present information for learning and retention. On the other hand, the pervasiveness of music from a growing number of delivery devices ensures we are now inundated with potential earworms. There are whole industries, such as advertising and popular music, that are in the business of making the catchiest ones. Our brains are quite prone to getting stuck on pieces of music, so it is important that new methods are developed to protect against undesirable earworms and especially musical obsessions. In that way, music may be maintained as a source of enrichment in our lives rather than a torment.

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