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Case report

‘Mastication rage’: a review of misophonia – an under-recognised symptom of psychiatric relevance?

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Abstract

Objective: To explore the condition of misophonia, its definition, possible neurological correlates, its associated morbidity, its possible psychiatric relevance and potential treatment.
Method: Provision of an illustrative case vignette and a review of the limited literature.
Results: Misophonia is a symptom associated with obsessive-compulsive disorder and anxiety disorders and may be a syndrome in itself associated with significant distress and avoidance. Treatments are not well validated.
Conclusion: Misophonia may be an under-recognised condition of psychiatric relevance.

Keywords: misophonia, human sounds, rage

A case of misophonia

The following account was provided to the author by a 41-year-old mother-of-two under his care for a mixed anxiety disorder complicated by extensive medical comorbities. She asked the author if he was aware of a condition she had self-diagnosed on the internet – misophonia.

> *My daughter was just sitting in the lounge eating carrots. I could hear each time she would pull back the alfoil and start to crunch. By the second crunching and alfoil noise it had started for me; I started breathing, trying not to react. Deep breathing, pacing, elevated heart rate, extreme anxiety. To me it seemed like minutes, but it was only seconds. I started grabbing my hair, shaky, my head was overwhelmed. By the next action of the foil being pulled back and the next carrot crunch, BANG, there was no more I could do to keep calm. My body and mind had taken over and I had started roaring at her, swearing and had no control.*

Methodology

The author, being previously unaware of the condition, performed a review of the literature using Pubmed and Google Scholar search engines. The literature is very limited, with two cross-sectional surveys and a number of case studies. As a consequence, all articles were assessed.

Historical development

The term *misophonia*, coined by audiologists Jastreboff and Jastreboff,[1] refers to a strong dislike of certain sounds and an abnormally strong reaction to them, characteristically anger and even rage. The above account captures the essence of misophonia, literally ‘hatred of sound’ or, more specifically, intense negative reaction to certain sounds, as captured in the pseudonym ‘selective sound sensitivity’ [Johnson] [2]. Originally described in the audiology literature, it has become increasingly recognised as a neuropsychiatric symptom of potential relevance in a range of psychiatric conditions and as a potentially disabling disorder in itself.

Unlike other symptoms of auditory disease, including tinnitus and hyperacusis (which are both frequently associated with misophonia), the purest form of misophonia can occur without activation of the auditory apparatus.[1] The potential for psychological factors to be of significance in misophonia is illustrated by Jastreboff and Jastreboff.[1] As they state,[1: p.3] ‘the strength of the patient’s reaction is only partially determined by the

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physical characteristics of the upsetting sound … it is also dependent on the patient's previous evaluation of and recollection of the sound, the patient's psychological profile and the context in which the sound is presented'.

Clinical descriptions

The sounds that most frequently induce misophonia are bodily sounds, especially those associated with eating (81%) or breathing (64%).[3] Other sounds that more frequently induce misophonia include repetitive sounds such as pen tapping or clicking, but there are many sounds that can be associated with the condition.[3] Repetitive sounds may be particularly troubling, as may spoken 'S' sounds. Subjects in a study by Edelstein et al.[4] described trigger sounds evoking intense affects toward the person making the offensive sounds, very similar to the case described at the start of this article, for example 'I hate this person'. Their study findings also confirmed the substantial disability related to this condition,[1] with subjects avoiding situations likely to provoke symptoms, including meals with family and friends. Subjects also described problems with attending lectures due to offending sounds by classmates.[4]

Epidemiology of misophonia

There is limited information regarding the prevalence of the condition, but it may be quite common. The audiology literature describes a 40% comorbidity of hyperacusis with tinnitus, but there is a lack of information specific to misophonia.[1] Probably the most useful guide to prevalence is from Wu et.al's[5] sample of 483 undergraduates, in which nearly 20% reported clinically significant misophonia symptoms.

Neurobiology of misophonia

The pathophysiology of misophonia is unknown. It is known that the characteristics of sound can contribute to its potential to be aversive, and knowledge of the origin of a sound can also influence the extent to which it is aversive. Reuter and Oehler[6] showed that the galvanic response to the noise of nails on a blackboard was diminished if the subjects were, incorrectly, informed that the noise was from pieces of contemporary music.

In a related fashion, the context in which the sound is produced is relevant in misophonia. A characteristic feature of misophonia is that the bodily sounds produced by significant others are quite likely to induce extreme emotional responses.[4] Interestingly, similar sounds elicited by the misophonia sufferer themselves do not elicit a response.

Misophonia is felt to reflect a heightened level of connectivity between the auditory, autonomic and limbic systems. Taking this concept further, it has been suggested that misophonia could be considered a type of *sound–emotion synaesthesia*. The inducers and concurrents of synaesthetes can be emotional rather than perceptual and, like synaesthesia, the neurological basis of misophonia may be a consequence of pathologically enhanced connections between brain regions.[4]

A case-controlled comparison of skin conductance response (a measure of sympathetic nervous system arousal) in subjects with misophonia exposed to a variety of visual and auditory stimuli demonstrated subjects having higher skin conductance response to auditory but not visual stimuli.[4] While both groups found certain stimuli aversive, study subjects demonstrated more marked subjective aversive responses. Significantly, both controls and misophonia subjects found similar stimuli to be aversive, raising the possibility that misophonia sufferers were not intrinsically different from those without the condition, 'but merely at the tail end of the distribution'.[4:10]

Associations with anxiety disorders

The avoidance and subsequent disability associated with misophonia has obvious parallels with some anxiety disorders and with obsessive-compulsive disorder. Wu et al.[5] investigated the incidence of misophonia symptoms and associations of these symptoms with other disorders, including obsessive-compulsive disorder, anxiety disorders and depression, in a sample of 483 undergraduate college students. Their study involved administration of a specifically designed misophonia questionnaire in addition to a battery of other questionnaires exploring more general sensory defensiveness, disability, obsessive-compulsive symptoms, anxiety symptoms, depressive symptoms and rage. They also found moderate but statistically significant correlations between misophonia symptoms and obsessive-compulsive, anxiety and depressive symptoms. A strong correlation was found between misophonia and general sensory defensiveness.

Possible association of misophonia and eating disorders

Kluckow et al.[7] report case studies of three patients with eating disorders who report characteristic misophonia symptoms and raise the interesting question as to whether we should screen for misophonia in eating disorders. Stiegler's[8] review of sound sensitivity in autistic spectrum disorder finds virtually no evidence of true physiological differences in patients with autistic spectrum disorder, suggesting the likely role of 'misophonic' responses to distressing sounds.

Nosological status – misophonia a stand-alone disorder?

While there are particular similarities between misophonia and obsessive-compulsive disorder, especially the preoccupation with and avoidance of a specific trigger, Shroder et al.[9] argue for a distinction on the basis of the

ubiquity of rage responses and lack of consistent compulsive behaviour in their study sample. They have proposed diagnostic criteria for misophonia as a new psychiatric disorder. They found evidence of common characteristics in their subject group of 42 patients. These features included a mean age of onset of 13, triggering sounds all being made by humans (the most frequent sounds being eating sounds, breathing sounds and finger/hand sounds), a 28.6% rate of verbal aggression and a 5% rate of past physical aggression. Interestingly, they also reported an 11.9% incidence of a similar response triggered by others' movements, which they coined *misokinesia*.

Their suggested criteria for misophonia have some parallels with panic disorder and obsessive compulsive disorder. They include the presence or anticipation of a specific sound made by a human being and the provocation by that sound of an intense impulsive aversive physical reaction that instantaneously becomes anger; a profound sense of loss of control associated with the experience; a recognition that the reaction is disproportionate; and significant distress or disability related to the condition.

Treatments

There is limited information regarding treatment and minimal validated evidence for treatment efficacy. The use of sound generators (coloured noise of the troubling frequency) to muffle the offending sound, in combination with family support and education, may be helpful in reducing the severity of reactions.[4,10–11] An alternative approach is using pleasant sounds (e.g. music) to distract from the offending sound and positive association and desensitisation with graded exposure to the offending sound.[10–11] Cognitive behavioural approaches and hypnosis have also been advocated.[10–12] Maguire et al.[12] report on two cases of apparently successful treatment of misophonia in two cases with CBT involving graded exposure to increasingly noxious sounds and restructuring of unhelpful cognitions (e.g. relating to the person making the sound), and described encouraging outcomes.

Sufferers may find relief from mimicking the offending sound or synchronising self-generated noises (e.g. chewing) with it.[4,11] Clearly, an understanding social environment is important so that others don't take offence. Greater insight into phenomena anecdotally associated with misophonia, including muscle tension, unwanted sexual arousal and the possibility of potentiation and generalisation of triggers has also been anecdotally reported as beneficial.[11]

Conclusion

While the literature relating to misophonia remains very sparse, there does seem to be a very recent spike in interest in this area. Online misophonia support groups are proliferating.[11,13,14] The psychiatric status of misophonia remains unclear. It would seem likely that misophonic symptoms are common but, typical of other spectrum conditions, there is significant disability at the extreme. The apparent association with anxiety disorders suggests further exploration of misophonia symptoms in this population may reveal significant potentially remediable disability.

There would also seem to be further avenues for collaborative research with audiologists, especially in developing treatment options such as the use of sound generators to facilitate graded exposure in CBT. Whether misophonia is a discrete syndrome remains a matter for debate and future study. It is possible that misophonia is a relatively common form of broader conditions of excessive environmental sensitivity. Clearly, there are a number of avenues for future research, but in the current state of knowledge, clinical consideration of possible misophonia symptoms may provide patients empathic understanding of a distressing and potentially disabling condition, and possibly provide treatment options.

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