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Current Trends in the Treatment of Misophonia

Mizofoni Tedavisinde Güncel Yaklaşımlar

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ABSTRACT

Misophonia is a disorder characterized by emotional and physiological responses that occur in response to certain auditory stimuli. Visual, tactile, and olfactory stimuli, primarily oral and nasal sounds such as eating, nose, and respiratory sounds, reveal misophonic responses. People with misophonia may have difficulty in social interactions, and work or school performance may be adversely affected. Misophonia symptoms can also cause anxiety, depression, and other mental health problems. Physiological reactions in the body, such as pain, sweating, tachycardia, hot flashes, and breathing difficulties, negatively affect people's physical health. For this reason, people's physical and mental health and quality of life are significantly affected. The absence of agreed diagnostic criteria for the diagnosis of misophonia and the lack of sufficient data to classify it as a psychiatric disorder has led to the lack of validated treatment guidelines. However, there are treatment recommendations discussed in the literature for misophonia, which has a prevalence of 20% in a limited number of studies and negatively affects the functionality of the individual. In the management of misophonia, tinnitus re-education therapy (TRT) was used as audiological treatment, antidepressants, and anxiolytics were used as pharmacological treatment and cognitive behavioral therapies were used as therapy. Other suggested treatment recommendations are neural remodeling technique, sequential remodeling hypnotherapy, trauma prevention technique, and trauma and tension reduction exercises. This review aims to present the treatment approaches available in the literature together and to understand the need for experimental evidence for treatment methods.

Keywords: Misophonia, decreased sound tolerance, treatment, treatment methods, psychotherapy

ÖZ

Mizofoni, belirli işitsel uyaranlara yanıt olarak ortaya çıkan, duygusal ve fizyolojik tepkilerle karakterize bir bozukluktur. Yeme sesleri, burun ve solunum sesleri gibi oral ve nazal sesler başta olmak üzere görsel, dokunsal ve koku uyaranları, mizofonik tepkileri ortaya çıkarmaktadır. Mizofoni, bireylerin sosyal ilişkilerinde sorun yaşamasına, iş ve akademik yaşantıda başarısızlığa yol açabilmektedir. Mizofoni semptomları, kaygı, depresyon ve diğer ruh sağlığı sorunlarının da ortaya çıkmasına neden olabilir. Vücutta ağrı, terleme, taşikardi, sıcak basması, nefes alma güçlükler gibi fizyolojik tepkiler, kişilerin fiziksel sağlığını da olumsuz etkilemektedir. Bu nedenle kişilerin hem fiziksel ve ruhsal sağlığı hem de yaşam kalitesi önemli ölçüde olumsuz etkilenmektedir. Mizofoninin tanılanmasında uzlaşılmış tanı kriterlerinin yokluğu ve psikiyatrik bir bozukluk olarak sınıflandırmak için hala yeterli verinin olmaması, geçerliliği kanıtlanmış tedavi rehberleri bulunmamasına yol açmıştır. Ancak, kısıtlı sayıda çalışmalarda yaygınlığı %20'ye ulaşan, kişinin işlevselliğini olumsuz etkileyen mizofoni için alan yazında tartışılan tedavi önerileri bulunmaktadır. Mizofoni, tinnitus yeniden eğitim terapisi (TRT), antidepresan ve anksiyolitik ilaç grupları ve bilişsel davranışçı terapiler ile tedavi edilmektedir. Önerilen diğer tedavi yaklaşımları nöral yeniden modelleme tekniği, sıralı yeniden modelleme hipnoterapi, travma önleme tekniği, travma ve gerilim azaltma egzersizleri olarak sıralanmaktadır. Bu derleme ile literatürde var olan tedavi yaklaşımlarının bir arada sunulması, tedavi yöntemleri için deneysel kanıtlara duyulan ihtiyacın anlaşılması amaçlanmaktadır.

Anahtar sözcükler: Mizofoni, azalmış ses toleransı, tedavi, tedavi yöntemleri, psikoterapi

Introduction

Misophonia is characterized by emotional and physiological responses to specific auditory stimuli. Auditory stimuli include eating sounds produced by humans, oral and nasal sounds such as nasal and respiratory sounds, and the sounds of animals or objects in operation. Visual triggers (such as scratching) are also occasionally described (Jager et al. 2020). The response to visual triggers may occur with auditory triggers (jaw movements of the person eating) or due to its repetitive nature (Wu et al. 2014, Jager et al. 2020). Although rare, odor and tactile stimuli are also reported as triggers (Siepsiak et al. 2020). Misophonia usually begins in childhood or adolescence (Schröder et al. 2013). In response to triggers, physical symptoms such as anxiety, distress, feelings of anger and muscle tension, tightness or pain in certain areas or the whole body, sweating, tachycardia, hot flashes, and breathing difficulties occur (Ferrer-Torres and Giménez-Llort 2022). The person feels a strong desire to stop the person making the noise. People can use auxiliary tools such as headphones or imitate the sound to

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avoid hearing triggering sounds. The person who does not know when he/she will encounter the trigger sound is constantly anxious. Therefore, they avoid certain environments or people who may be exposed to the trigger sound (Palumbo et al. 2018). Psychiatric disorders such as post-traumatic stress disorder (PTSD), obsessive-compulsive disorder, major depression, and anorexia nervosa, which accompany the diagnosis of schizophonia, complicate the clinical picture (Erfanian et al. 2019).

Although misophonia's exact prevalence is unknown, a limited number of studies have investigated its prevalence. A study conducted on university students (Wu et al. 2014) reported that 20% of the sample had clinically significant misophonia symptoms (Wu et al. 2014). In another study (Zhou et al. 2017) conducted on a sample of four hundred and fifteen people, those who "often" or "always" experienced sensitivity to trigger sounds constituted 20% of the sample (Zhou et al. 2017). In a study conducted with 427 participants in Turkey (Kılıç et al. 2021), the prevalence of diagnosis of misophonia was found to be 12.8% (Kılıç et al. 2021). The variation in the prevalence of misophonia is due to the difference in the measurement tools used and the samples studied. There are various views on the etiology of misophonia. The onset of misophonia is often associated with early childhood experiences. Unpleasant childhood experiences can be remembered with misophonic triggers that reveal negative emotions in the person (Edelstein et al. 2013, Claiborn et al. 2020). Genetics, some diseases (obsessive-compulsive disorder, Williams syndrome, or autism spectrum disorders), neurobiological changes, and classical conditioning are other explanatory hypotheses proposed to understand the origins of misophonia (Ferrer-Torres and Giménez-Llort 2022). Although diagnostic criteria have been proposed by researchers for misophonia, which is not included in official classification systems such as the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) or the International Classification of Diseases, Eleventh Edition (ICD-11), there is no consensus on its diagnosis (Kılıç et al. 2021). There are no official diagnostic criteria for misophonia, and there are insufficient study results in the literature to classify it as a psychiatric disorder. Uncertainties in diagnosis and classification render therapeutic interventions inadequate. Despite advances in treatment, there are no validated treatment guidelines. Audiological, pharmacological, and therapy methods (eye movement desensitization and reprocessing [EMDR], cognitive behavioral therapy [CBT]), which have been studied in recent years and can be presented as possible treatment methods, should be addressed with a multidisciplinary approach (Ferrer-Torres and Giménez-Llort 2022). In this context, the review aims to increase the number of experimental studies on the treatment of misophonia by presenting current approaches to the treatment of misophonia.

Audiological Treatments

Tinnitus retraining therapy (TRT) is a treatment protocol established by Jastreboff with the primary goal of managing tinnitus and the secondary goal of managing hyperacusis and misophonia (Jastreboff and Jastreboff 2006). TRT aims to eliminate the conditioned reflex in the management of misophonia. This approach is because misophonia contains triggers that cause conditioning. Therefore, this method involves systematic exposure to trigger sounds to accustom the patient to the trigger sounds. The four misophonia-specific TRT protocols eliminate conditioned reflexes and transform disturbing sounds into positive associations. The protocols differ in terms of the patient's control over the environment, the sounds used, and the duration of exposure (Palumbo et al. 2018, Zitelli 2021).

In Protocol 1, the patient has complete control over the sound's choice, level, and duration. In this context, a sound that the patient finds pleasant is played to the patient in a 3-week cycle. In the first week, the patient listens to the pleasant sound determined by the patient for 15-30 minutes once or twice a day, again at the level determined by the patient. In the other weeks, the level of the sound gradually increased. It is expected that the positive associations formed with the principle of stimulus generalization will spread to include similar sound types. This protocol aims not to expose the patient to any sound or disturbing sound but to enable the patient to establish a relationship with the positive sound. In Protocol 2, the patient has no direct control over the sound level, even if the patient is free to choose the sound. Control of the volume is in the hands of the patient's relatives, who can set the level that the patient can tolerate. This protocol reduces the patient's control over the volume, although a positive association with the voice is established. Protocol 3 involves the patient choosing the sound type, but the sound level is out of their control. Movie theatres, shopping centers, and noisy shops are used to expose the patient to various sounds that he/she may encounter daily. If the situation causes severe discomfort, the patient can leave the environment for 10-15 minutes. Protocol 4 deals with disturbing sounds. The sound with positive associations is combined with the disturbing sound, and the levels of the two types of sound are gradually changed. The ratio of positive sound to negative sound is gradually reduced. In this protocol, attention should be paid to the environment in which the application takes place. People react differently

depending on the environment they are exposed to sounds. For this reason, it is necessary to work with less disturbing sounds and situations in environments where the emotional and physiological response of the person to sounds is known to be higher (Jastreboff and Jastreboff 2014).

The patient's adherence to the treatment protocol and conscious effort are essential for the success of TRT treatment. This success is possible with counseling in treatment. Counseling in treatment includes evaluating symptoms and their effect on daily life, informing about the factors affecting severity, stress management, relaxation techniques, determination and implementation of TRT protocol, frequency, duration of treatment, and setting realistic goals. The goals to be achieved as a result of the treatment are determined by focusing on issues such as what kind of changes the patient wants to make to cope with his/her symptoms and in which areas he/she requests help or support. Monitoring the achievement of goals includes regular evaluation and feedback processes. The counselor is responsible for following the progress of the individual, addressing any problems, and updating the treatment plan if necessary (Jastreboff and Hazell 1993). In a study conducted at Emory University (2014), TRT was administered to a group of one hundred and eighty-four patients with misophonia, and more than 80% of them reported improvement in the severity of misophonia symptoms after treatment (Jastreboff and Jastreboff 2014).

Technical-electronic aids such as headphones and room fountains can be used to reduce the effect of trigger sounds. Special devices that allow the production of sounds adapted to the environment or person with a small electronic component are known as tinnitus maskers and can be used in treatment. Although they are frequently used treatments, data from controlled studies are limited (Schwemmle and Arens 2022).

Pharmacological Treatments

Due to the lack of experimental pharmacotherapy trials, there is no approved standard of pharmacological treatment for misophonia. However, antidepressant and anxiolytic drugs are frequently used for the management of the symptoms of misophonia. Case series and case reports provide insights that will lead to drug experimental studies (Ferrer-Torres and Giménez-Llort 2022).

Alekri and Al Saif (2019) reported that an 18-year-old female patient presented with anxiety symptoms and suicide attempts due to misophonia. Initially treated with psycho-pharmacotherapy, no improvement was observed. However, when the young patient was treated with escitalopram or fluoxetine, which are in the serotonin reuptake inhibitors (SSRI) group, and her adherence to psychotherapy sessions increased, there was a significant reduction in the severity of misophonia (Alekri and Al Saif 2019).

Webb (2022) reported a 16-year-old adolescent patient with negative physical and emotional reactions to auditory and visual triggers. The patient, who avoided family meals due to symptoms occurring at the dinner table, was started on 10 mg propranolol, a β-blocker for the treatment of adrenergic symptoms, and increased to 60 mg in a few weeks. Above 60 mg, the patient experienced mild sedation and continued propranolol treatment without side effects. The efficacy of propranolol was evaluated with the Amsterdam Misophonia Scale (A-Miso-S), which determines the degree of misophonia. While the A-Miso-S score was 15 when the patient did not take propranolol, the A-Miso-S score was recorded as 2 when the patient took propranolol (Webb 2022).

Pan et al. (2022) reported a 32-year-old male patient with autism spectrum disorder and severe misophonia who experienced behavioral outbursts in response to trigger sounds. It was noted that the patient, who was given 2 mg risperidone twice a day, felt less irritable and could tolerate trigger sounds, and his A-Miso-S score decreased from 31 to 5 (Pan et al. 2022).

Sarıgedik and Yurteri (2021) reported a 14-year-old adolescent patient with symptoms of excessive disturbance from sounds, withdrawal to his room, and anger. Fluoxetine 10 mg was started for the patient with an A-Miso-S score of 18, and the dose of the drug was increased up to 30 mg. In the fourth month of pharmacological treatment, a 40% decrease in the A-Miso-S score was recorded (Sarıgedik and Yurteri 2021).

Osuagwu et al. (2020) reported a 14-year-old male patient with symptoms of distraction emotional distress and disgust towards the sounds made by his mother. The patient was started on methylphenidate for inattention and cognitive-behavioral therapy for misophonia symptoms. After the treatment, it was observed that the patient's distraction and symptoms related to misophonia improved significantly (Osuagwu et al. 2020).

Tunç and Başbuğ (2017) reported a 22-year-old male patient who described disgust, hatred, and extreme intolerance towards some sounds. It was stated that the patient left the environment where the triggering sounds were present and physically attacked the person producing the sound with the desire to stop. The patient was started on alprazolam (0,5 mg/day), an anxiolytic agent, to manage the symptoms of his misophonia, and

the drug was discontinued three days after his symptoms improved. Psychoeducation was given to the patient, and coping strategies were recommended to maintain recovery (Tunç and Başbuğ 2017).

Misophonia symptoms overlap with the emotional and autonomic response that can be seen in mental disorders such as PTSD, panic disorder, and phobias. 3,4-methylenedioxy-N-methylamphetamine (MDMA) can be used in autonomic arousal disorders caused by negative stimuli (Parrott 2007). The autonomic response elicited by the trigger sound, which is a negative stimulus, can also be reduced by MDMA. MDMA can be used as a supportive agent in psychotherapy sessions to reduce negative emotions, promote acceptance and empathy, and reduce fear and avoidance in patients with schizophrenia. Considering the similarity of the symptoms of PTSD and misophonia, the protocol used in the Multidisciplinary Association for Psychedelic Studies (MAPS) Phase 3 studies is also considered appropriate for patients with misophonia. Within the protocol, 75-125 mg of oral MDMA should be given in a total of 2-3 sessions, each given approximately one interval apart. The patient should receive three preparatory psychotherapy sessions before receiving MDMA doses, and the total number of sessions should be completed to 8-10 sessions, with psychotherapy sessions to be applied after dosing (Webb and Keane 2022).

Therapies

Even though the research and treatment efforts for misophonia were first made in the field of audiology, studies in the field of mental health are accelerating today. Although studies in the field focus on cognitive-behavioral therapies, acceptance and commitment therapy (ACT), dialectical behavior therapy (DBT), and eye movement desensitization therapy (EMDR) are other therapy methods that have been investigated for their efficacy in the treatment of misophonia.

CBT improves coping skills to prevent the symptoms of misophonia and respond appropriately to triggers. Although there is no proven psychological therapy protocol yet, studies are based on the general principles of cognitive-behavioral therapy (Ferrer-Torres and Giménez-Llort 2022). In individuals suffering from misophonia, emotional reactions and physical sensations begin in the presence of a triggering sound. These initial reactions and sensations lead to negative thoughts and more negative emotions and physical sensations. Negative thoughts, in turn, intensify the reactions and sensations to the misophonic triggers and lead to a vicious circle. CBT aims to break the vicious cycle by revealing negative thoughts (Aazh et al. 2019).

Case reports and case series have demonstrated success in reducing the symptoms of misophonia using CBT and exposure (McGuire et al. 2015, Reid et al. 2016). In the study by McGuire and colleagues (2015), CBT focused on enabling trigger sounds to be tolerated rather than making them pleasant. Gradual, repeated, and prolonged exposure to trigger sounds helped people get used to the distress caused by triggers and reduce avoidance behaviors (McGuire et al. 2015). Dialectical behavior therapy can be applied in cases where the exposure method does not provide healing and increases the patient's anger (Kamody and Del Conte 2017). In the group CBT protocol conducted by Schröder and colleagues, four different techniques were used to prevent the exposure method from increasing misophonia symptoms. These techniques include task concentration, counter-conditioning, stimulus manipulation, and relaxation exercises (Schröder et al. 2017). Task concentration exercises aim to change the attentional bias by addressing it. Significant stimuli that elicit an emotional response attract the person's attention and cause attention bias. These exercises help patients focus on different external stimuli (Bögels 2006, Schröder et al. 2017). Counter-conditioning, stimulus manipulation, and relaxation exercises were also included in task concentration exercises to reduce intense feelings of anger and disgust (Schröder et al. 2017). With counter-conditioning, triggers that cause intense anger and disgust are paired with an intense, pleasant, unconditional stimulus (a video or image that the person may like) to initiate positive associations (Dozier 2015, Schröder et al. 2017). The repetitive nature of trigger sounds, coupled with their unpredictable occurrence, fosters a sense of uncontrollability in patients. The misophonic triggers can be manipulated with tools that allow for modifying trigger sounds and images. This modification will create a sense of control over triggers (Schröder et al. 2017). Relaxation exercises, which are commonly used in disorders such as anger management or PTSD, are effective in coping with increased irritability in misophonia (Grodnitzky and Tafrate 2000, Schröder et al. 2017). Group therapy was preferred because it provides better visualization of social situations and leads to new learning with interaction. With the group CBT protocol, it was observed that half of the patients experienced a decrease in misophonia symptoms (Schröder et al. 2017). CBT has also been confirmed to be effective in the management of anger caused by triggering sounds (Roushani and Mehrabizadeh Honarmand 2021). A randomized clinical trial using a protocol in which reassessment and stress reduction methods were also affected showed that 56% of patients who completed CBT studies showed clinical

improvement. Improvement in misophonia symptoms continued 12 months after the end of treatment (Jager et al. 2020).

The other ways of managing misophonia are compassion training, distress tolerance, and acceptance-based therapies (Schneider and Arch 2015, Ferrer-Torres and Giménez-Llort 2022). In a study by Ghorbani et al. (2022), the effects of online acceptance and commitment therapy (ACT) and online CBT methods on the symptoms and quality of life of misophonia were examined and compared. Although no significant difference was found between the two treatment methods, it was observed that the symptoms of misophonia, anxiety, stress, and depression decreased, and distress tolerance increased (Ghorbani et al. 2022). In the literature, ACT provided a decrease in both symptoms of misophonia and depressive symptoms in a 12-year-old girl (Petersen and Twohig 2023) and a decrease in symptoms of misophonia in a 17-year-old boy (Schneider and Arch 2017). ACT does not aim to eliminate or change the emotional reactions in response to triggers. It aims to accept difficult experiences, detach oneself from inner experiences, increase contact with the present moment, and engage with meaningful things such as values. ACT is considered a good treatment option as it directs individuals with misophonia to engage with what is meaningful and reduces the emotions caused by triggers (Petersen and Twohig 2023). Although there are no experimental studies on compassion-focused therapy, mindfulness, and acceptance-based therapies, these therapies are predicted to be beneficial in managing misophonia (Schneider and Arch 2015, Ferrer-Torres and Giménez-Llort 2022).

Eye Movement Desensitisation and Reprocessing (EMDR) aims to reduce misophonia symptoms by identifying the patient's experiences with misophonia and reprocessing maladaptive implicit memories. The EMDR stages, which are applied in eight stages, are given below.

1. History (symptoms, memories that are the source of problems, and identification of goals)
2. Preparation (information about EMDR, equipping patients with strategies for better self-regulation during therapy)
3. Assessment (identification of negative cognitions, disturbing emotions, and bodily sensations related to the memory and identification of the targeted positive cognition)
4. Depersonalisation (becoming aware of uncomfortable feelings, thoughts, or body sensations until one reports a marked reduction in negative cognitions and distress about the experience)
5. Embedding (encouraging the experience to be associated with more adaptive positive cognition)
6. Body Scan (questioning and processing the presence of a negative physical sensation related to the memory)
7. Closing (including the use of stress management and tolerance strategies, giving feedback)
8. Reassessment (questioning the necessity of additional study) (Jager et al. 2021)

EMDR significantly reduces misophonia symptoms by desensitizing the memories that cause the onset or worsening of misophonia symptoms (Jager et al. 2021).

Table 1. Treatment procedures applied in the management of misophonia

Audiological Treatments	Pharmacological Treatments	Therapies	Other Treatments
Tinnitus retraining therapy (TRT)	Serotonin reuptake inhibitors (SSRI)	Cognitive behavioural therapy (CBT)	Neural remodeling technique
Technical-electronic aids such as headsets, room fountains	Propranolol (β-blocker)	Acceptance and commitment therapy (ACT)	Trauma prevention technique
Tinnitus maskers	Risperidone (Antipsychotic)	Dialectical behaviour therapy (DBT)	Trauma and stress release exercises
	Methylphenidate	EMDR (Eye Movement Desensitisation and Reprocessing)	Sequential remodeling hypnotherapy
	Alprazolam (Anxiolytic)		
	3,4-methylenedioxy-N-methylamphetamine (MDMA)		

Other Treatments

The neural remodeling technique, a recommended treatment method in managing misophonia, involves the presentation of triggers at a low level to eliminate the emotional and physiological response. To mitigate negative emotions in the patient, an environment is created where favored sounds are prevalent, and trigger sounds are minimally present. The trauma prevention technique provides the alienation of the triggers and the reaction to the triggers. In this technique, acupuncture points where the patient can observe his/her emotions are worked on. It is aimed to eliminate the muscle tension that arises in misophonia with trauma and tension release exercises. In this context, methods such as progressive muscle relaxation, yoga and meditation, and hypnosis can be applied. Sequential remodeling hypnotherapy, which involves the dissociation of the physical reaction that occurs in response to triggers from the emotional effect, aims to reduce the severity of misophonia (Seebeck and Dozier 2023). The lack of experimental studies related to these methods, which are thought beneficial in managing misophonia, creates uncertainty about applying the proposed methods. Table 1 shows the treatment procedures applied in the management of misophonia.

Conclusion

Misophonia is a common disorder that is often accompanied by psychiatric diagnoses and significantly reduces the quality of life. Although it has a significant negative impact on the patient's life, there is no standardized, approved treatment procedure. This review article discusses the treatment methods used in Turkey and the world in managing misophonia and draws attention to the need for experimental studies. Although the studies in the field are promising, the uncertainty of the mechanism and diagnosis of misophonia creates a disadvantage in establishing treatment protocols. For this reason, international organizations should lead the way in understanding the diagnosis and treatment process of the disease. A collaborative and team-based model should be adopted in treatment studies, which started with audiological treatments and focused on psychology and psychiatry disciplines in recent years. Future research should focus on testing the treatment procedures, the effectiveness of which has been revealed in the literature with case series and case presentations, with randomized controlled trials. In this context, the collaboration of disciplines such as psychology, psychiatry, audiology, and neurology can accelerate the provision of empirical evidence necessary for understanding the disease and developing treatment protocols.

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