Oral Malodor (Halitosis)

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Abstract

The public is greatly concerned about the impact of breath on personal and professional aspects of life. It is an issue that affects one's quality of life and social relationships leading to feelings of self-esteem, sadness and other mood disorders. Professionals such as dentists, doctors, dietitians and psychologists should collaborate to assess and provide treatment for this problem. Therefore, it is crucial to study the causes and explore treatment options for halitosis. With society's increasing emphasis on cleanliness interest in odor has also grown. Bad breath can cause distress and impede social interactions because it is challenging to detect oral malodor on our own. Even individuals who do not have bad breath might experience anxiety or distress when they notice others reacting by pinching their noses or making grimaces during conversations. Given its origins, addressing breath requires a comprehensive evaluation and intervention from experts, in dentistry, medicine, nutrition and psychology.

Key words: *Malodor, Halitosis, Bad breath, Volatile sulfur compounds*.

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Introduction

Each of the many complex compounds that make up human breath has a unique scent that can lead to unpleasant conditions like halitosis. Halitosis is a combination of the Latin words halitus, which means "breathed air," and osis, which means "pathologic alteration."[1]

The disagreeable breath odor that emanates from the mouth is known as oral malodor, or halitosis.[2] Regardless of whether the disagreeable components in expired air originate from nonoral or oral sources, the term "oral malodor" encompasses any offensive odor. It is also known as breath malodor, halitosis, or fetor ex ore or fetor oris. Anaerobic oral bacteria that create volatile sulfur compounds (VSCs) are responsible for about 80% to 90% of cases of halitosis.[3]

Oral malodor is mostly caused by volatile sulfur compounds (VSCs), which include hydrogen sulfide, methyl mercaptan, and dimethyl sulfide. These molecules have been linked to the pathophysiology of

periodontal disease because of their extremely low toxicity to oral tissues, detrimental effects on human gingival fibroblast protein production and collagen metabolism, activation of oxidative stress, and other variables.

This suggests that many patients who first complain of bad breath will also have some degree of gingival and periodontal disease. People with periodontitis who have bad breath are said to have more advanced disease than those without.[4] Halitosis is thought to involve non-oral causes in 10–20% of cases.[5]

Oral health behavior is significantly influenced by attitudes and beliefs about oral health.[1] The patient and dentist must work together to maintain a healthy oral profile. How a population feels about their dentition is one of the most important elements influencing their dental health.[6] Interest in odor has increased as society becomes more sanitary. Mouth odor is difficult to detect on one's own, therefore foul breath has a significant negative impact. Many people worry or get upset about their mouth odor, even if they do not have it. During a conversation, people may assume someone has foul breath if they grimace or squeeze their nose.[7]

Classification of Halitosis (Types of Halitosis)

According to origin

Physiologic malodor: Caused by a reduction in salivary flow.

For instance, the aromatic molecules in tobacco and some foods, such as onions and garlic, can also contribute to foul breath.

- Pathologic malodor: The existence of a preoccupation with unpleasant mouth odor.

  e.g.: Periodontal disease, poor oral hygiene, tongue coat, food impaction, unclean dentures, faulty restorations, oral carcinomas, and throat infections.
- Pseudo malodor: Others do not notice halitosis, and with counseling and easy fixes, the issue gets better.
- Halitophobia: When a patient continues to have halitosis despite the absence of overt symptoms.

According to cause

- **Oral:** Xerostomia, tongue coating, dry socket, exposed necrotic pulp, smoking, stress, poor oral hygiene, periodontal diseases, and food impaction.
- **Non-oral:** Infection of the tonsils, maxillary sinuses, throat, nose, ear, or pulmonary system

Malodor: Oral malodor is common and can affect people of all ages. When severe or chronic, it may reduce self-confidence and social relationships.[8]

Box 1: Common causes of the manifestation of oral halitosis

Oral disease
- Food impaction
- Acute necrotising ulcerative gingivitis
- Acute gingivitis
- Adult and aggressive periodontitis
- Pericoronitis
- Dry socket
- Dry mouth
- Oral ulceration
- Oral malignancy

Respiratory disorder
- Foreign body
- Sinusitis
- Tonsillitis
- Malignancy
- Bronchiectasis

Volatile foodstuffs
- Garlic
- Onions
- Spiced foods

Problems faced by patients: Oral malodor is a major problem for the public because of its detrimental consequences on both personal and professional lives.4. It is a significant problem that harms quality of life and social interactions, which in turn directly contributes to depression, low self-esteem, and other mood disorders.[9] The barrier that the afflicted people's foul breath places in their connections with their

friends, family, and coworkers has a devastating effect on their everyday social life and interpersonal contact. Therefore, it is commonly known that when someone sees oral bad breath, whether real or imagined, it causes them to take behavioral action to breathe fresh air again, which in turn promotes their social and psychological well-being.[10] Understanding one's own sense of mouth odor, the harmful effects of smoking, and one's own oral hygiene habits may therefore be necessary.[3]

Sources of malodor: Oral odor is prevalent upon awakening and is not believed to be a sign of halitosis. The most common causes of persistent foul breath are oral or, in rare instances, nasopharyngeal diseases. The most common cause of foul breath is the buildup of food particles and dental bacterial plaque on the tongue and teeth due to inadequate oral hygiene, which causes inflammation of the gingiva and periodontal tissues. The most noticeable halitosis is caused by acute necrotizing ulcerative gingivitis (Vincent's disease, trench mouth), while it can be caused by most forms of gingivitis and periodontitis. Unpleasant oral scents can result from aggressive periodontitis, which is characterized by rapid loss of periodontal bone and consequent tooth movement. Bad breath can also be caused or made worse by poor oral hygiene brought on by xerostomia (dry mouth), and some research indicates that wearing dentures may sometimes make bad breath worse by increasing deposits of tongue coat.[8]

Other sources of malodor: A common mild, transient mouth odor that often develops after sleeping is called morning halitosis. This may be more common in those who sleep in warm, dry conditions or those who have nasal blockages, such as those who have upper respiratory infections. A person may experience transient bad breath after eating volatile foods like garlic, onions, or spices (durian is said to be the worst). This smell could last for a few hours. Cigarettes and alcohol can produce unique mouth scents that can linger for several hours, much like betel nut products can have an almost constant stench if a person has a chronic habit.[8]

Oral malodor may be caused by respiratory tract diseases or by nasal or sinus secretions that reach the oropharynx, or by those who breathe mostly via their mouth. Tonsillitis can also result in halitosis. Additionally, a strong stench coming from the breath could be caused by foreign items in the nose.[11] Lung infections like bronchiectasis and lung infections linked to malignancy can also cause halitosis.

In rare cases, foul breath can result from several systemic diseases. The halitosis linked to these conditions is typically an unintentional discovery made during a clinical examination rather than an early indication of the disease, like undiscovered type 1 diabetes mellitus. Interestingly, Helicobacter pylori infection has been connected to a subjective alteration in oral odor.[12] Bad breath is a rare side effect of many drugs. For example, nitrates, dimethyl sulfoxide, phenothiazines, amphetamines, and nitrates.

Body odor and chronic bad breath are hallmarks of trimethylaminuria, sometimes known as "fish odor syndrome," an uncommon condition. Trimethylamine in excess produces a powerful ammoniacal smell like that of rotting fish. This disease can be brought on by either flavin defective (usually genetically determined) monooxygenase activity or an overabundance of flavin monooxygenase precursors, like those generated when choline is used to treat Alzheimer's disease or Huntington's chorea.[13]

Hypermethioninemia is another rare metabolic condition that can result in foul breath.[14]

To lessen their perceived issue, these people may eventually begin to do a variety of things, such as covering their lips when speaking, avoiding other people, or avoiding social situations. Such individuals typically misunderstand other people's actions as a sign that their breath is offensive.[8] Halitophobics usually get obsessed with cleaning their teeth and tongue, abusing mouthwash, mints, chewing gum, and sprays to ease their discomfort.[8]

Box 2: Clinical assessment of oral halitosis

Subjective

- Intensity-the organoleptic procedure
  - Smelling expelled air of mouth and nose separately
  - Easy to do, requires no clinical training
- Quality-the hedonic procedure
  - Rarely clinically applicable
  - Requires well trained clinical judges

Objective

- Detection of sulphides with appropriate monitor—simple, but may fail to detect oral halitosis caused by non-sulphides components
- Gas chromatography—not applicable for routine clinical practice
- Bacterial detection (such as benzoyl-arginine-naphthylamide test, polymerase chain reaction, dark field microscopy)—not applicable for routine clinical appication

Diagnosis: The clinical assessment of oral malodor is usually subjective (organoleptic evaluation) and involves smelling and comparing the air exhaled from the mouth and nose. If you smell bad in your mouth but not in your nose, it is most likely emanating from the throat or mouth. The sinuses or nose are most likely the source of any odor that originates only from the nose.[15] In rare cases, a systemic cause of the malodor may be expected if the severity of the mouth and nose scents is similar (box 2). The hedonic approach uses trained clinical judges to assess the quality of odor.[16,17]

Objective evaluation of the breath components is rarely used in routine clinical practice due to its high cost and time commitment. Although it is feasible to measure volatile sulfur compounds with a portable sulfide monitor, the source and intensity of oral malodor may not be precisely identified because it can be caused by substances other than volatile sulfur compounds. Despite being a potential method for determining the constituents of oral foul odor, gas chromatography of breath is not routinely employed in clinical settings. Similarly, the typical clinical assessment of oral malodor does not include the identification of bacteria that have trypsin-like activities (as shown by the benzoylarginine-naphthylamide test, dark field microscopy, and real-time quantitative polymerase chain reaction).[8]

Treatment of halitosis: Box 3 explains the halitosis treatment procedure. Reducing the accumulation of oral bacteria and educating the patient about the causes and prevention of the condition are the primary objectives of treatment. Bad breath can be significantly reduced by practicing good oral hygiene, such as brushing and flossing between teeth, especially for people with gingival and periodontal disorders. [18,19]

It is recommended to clean the tongue since it may be the source of foul breath if oral hygiene is already good or improves but the habit persists. A recent systematic analysis suggests that tongue scraping may only offer a slight long-term advantage in getting rid of mouth odor.[20] On the other hand, patients may benefit—at least temporarily—and no harm is anticipated if tongue cleaning is done regularly and

gently. Chewing gum seems to only momentarily lessen foul breath.[1]

Box 3: Treatment of oral halitosis
- Examine and manage possible systemic (non-oral) source if organoleptic procedure detects halitosis from both mouth and nose
- More oral hygiene by professional and patient administered tooth cleaning
- Routine atraumatic tongue cleaning
- Routine use of antimicrobial toothpastes and mouthwashes, such as Chlorhexidine gluconate, Methylpyridinium, Oil-water rinse, Triclosan/co-polymer/sodium fluoride toothpaste
- Routine clinical review to ensure maintenance of effective oral hygiene
- Halitophobia warrants referred to clinical psychologist

Lowering the bacterial load or the odoriferous substances that accompany it is how the range of mouthwashes suggested for treating oral malodor work.[22] Because it lowers the quantity of bacteria that produce volatile sulfur compounds, mouthwash or spray containing chlorhexidine gluconate may be more effective than oral hygiene alone at reducing oral odor for a few hours.[23] Another way to lessen oral odor is to use a mouthwash that contains cetylpyridinium chloride, zinc lactate, and chlorhexidine. Patients may be reluctant to use chlorhexidine for an extended length of time, though, due to its disagreeable taste, ability to burn the oral mucosa when used excessively, and potential for (reversible) tooth discoloration. A two-phase oil and water mouthwash can get rid of dental odor for hours without having any bad side effects.[24, 25] Additional mouthwashes that help lessen oral halitosis for hours include zinc chloride, cetylpyridinium chloride, and chlorine dioxide.[26,27]

Because triclosan has an antibacterial effect in addition to its direct action on volatile sulfur compounds, it may reduce oral halitosis when added to mouthwashes and toothpaste. The solubilizing agent used to administer triclosan, however, seems to have the biggest impact on the medication's capacity to neutralize volatile sulfur compounds. A combination of triclosan, co-polymer, and sodium fluoride seems to be particularly effective in reducing volatile sulfur compounds, oral bacteria, and bad breath.[28,29]

Experimental strategies to lessen oral halitosis include the use of glycosylation inhibitors, like d-galactosamine, the probiotic placement of bacteria, like Streptococcus salivarius, that alter the bacteria causing oral halitosis, light uncovering that directly inhibits bacteria that produce explosive sulfur compounds, or lethal photosensitization.
A licensed psychologist must refer patients with halitophobia for assessment and therapy. Unfortunately, few of these patients are prepared to proceed with this treatment.

Conclusion

As society grows more hygienic, interest in odor has grown. Bad breath is extremely painful psychologically and might interfere with social interactions because it is impossible to identify on one's own. Oral malodor can cause anxiety or distress for many people, even if they do not have it. People may presume someone has oral malodor if they see them clutching their nose or grimacing during a discussion. It required an interdisciplinary assessment and treatment plan from specialists such as psychologists, doctors, dietitians, and dentists because of its complex nature.

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