

Halitosis - I Love Bad Breath Said No One Ever!!- A Review

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ABSTRACT

Halitosis is a general term denoting unpleasant breath arising from physiological and pathological causes from oral and systemic sources which is a universal problem that can lead to a significant amount of social disharmony and embarrassment. This review article focuses on understanding oral malodor and its causes and treatment.

Key word: Oral malodor, Halitosis, Bad breath

INTRODUCTION

In simple words also known as “Bad Breath, Foul Odor, Feter ex ore, Feter oris”

Bad breath as they say is better than no breath at all. And as “George Orwell” said, “the road to wigan pier”. You can have affection for a murderer, but you cannot have affection for a man/woman whose breath stinks. Yet, halitosis is a common and universal problem that can lead to a significant amount of social disharmony and embarrassment and evidences reveal that it forms about 85% of all bad breath. ^[1]

TYPES OF HALITOSIS

True halitosis ^[2]

Real halitosis can be further subdivided into physiological and pathological halitosis. Physiologic halitosis includes halitosis caused by dietary components, deleterious habits, morning breath, secondary to xerostomia caused by physiologic factors. Pathologic halitosis occurs secondary to pathologic conditions or oral tissues like gingival and periodontal diseases like periodontitis, acute necrotizing ulcerative gingivitis, residual post-operative

blood, debris under dental appliances, ulcerative lesions of the oral cavity, Halitosis may be associated with coated tongue, may occur due to xerostomia secondary to salivary gland diseases, tonsilloliths.

Pseudohalitosis ^[2]

Patients who suffer from pseudohalitosis complain of the existence of halitosis though it is not perceived by others. This condition can be managed effectively by counseling (using literature support, education and explanation of examination results) and simple oral hygiene measures.

Halitophobia ^[2]

Some individuals continue to insist that they have halitosis even after they have been treated for genuine or pseudo-halitosis. Such individuals are categorized as halitophobic. Halitophobia may be considered when no physical or social evidence exists to suggest that halitosis is present.

Psychogenic Halitosis [2,3]

Psychogenic Halitosis is the one which is imagined. In this a person believes that his breath smells bad when it actually does not. This problem may occur in people who tend to exaggerate normal body sensations. Sometimes this is caused by a serious mental disorder such as schizophrenia. A person with obsessional thoughts may have an overwhelmed sense of feeling dirty. A person who is paranoid may have the delusion that his organs are rotting. Both these persons feel their breath smells bad. Such people may be helped by having a doctor or dentist assures them that they do not have bad breath. If the problem continues, person benefit from seeing a psychotherapist.

REASONS FOR HALITOSIS [4,5]

The condition is multifactorial in etiology and may involve both oral and non-oral conditions

- Temporary halitosis: It results from hot/spicy food, certain drinks, alcoholic beverages, coffee and most common

from garlic, onion, salty foods, spices, curries, cured foods.

- Morning breath: During sleep, the flow of saliva is reduced drastically and tongue and cheek move very little. This allows food residues to stagnate and the bacteria start to work on them, generates unpleasant smell.
- Smoking (cigarettes/cigars)
- Crash dieting/fasting: When the body is no longer supplied with energy giving carbohydrate, breakdown of fat happens and the waste product of their metabolism, ketones, endows the breath with a distinctive sweet and sickly smell.

Volatile sulphur compounds (VSC), namely hydrogen sulphide (H₂S) and methyl mercaptan (CH₃SH) are the main cause of oral malodor. These substances are by-products of the action of bacteria on proteins. Gram-positive bacteria produce little or no malodor; most Gram-negative bacteria are potent producers of odoriferous compounds. [TABLE 1]

TABLE 1: CAUSES FOR HALITOSIS [4-6]

SPECIALTY	CAUSE / BASIC DISEASE
Dentist	Coating of the tongue, Sub and / or supragingival biofilm, Gingivitis, Periodontitis, Candidiasis, Untended prosthesis, Abscesses, Open root canals, Overhanging restoration margins, Pemphigus, Morbus Behcet, Erythema exudativum multiforme, Ulcerating and decomposing tumors
ENT	Tonsillitis, Sinusitis, Pharyngitis, Diphtheria, Pfeiffer’s Disease, Angina Plaut Vincent, Debris, Abscesses, Lues III, Chronic rhinitis, Postnasal drip, Ulcerating and decomposing tumors
Internal Medicine	Putrid bronchitis, Pneumonia, Abscesses (lung), Xenoliths, Gangrene of the lung, Wagner’s granulomatosis, Gastric and intestinal diseases, Precomatose condition and coma (uremia, coma hepaticum), Diabetes mellitus, Oesophagitis, Yellow fever, Pharmaceuticals, Trimethylaminuria, Ulcerating and decomposing tumors, Diverticle

Food source for anaerobic bacteria that cause bad breath [7]

High protein foods include meat, fish, sea food and eggs; dairy foods such as milk, cheese, yoghurt; cereal grains and products; desserts especially cakes and pies.

These bacteria present on the surface of tongue. Secondary locations can be at or below person’s gum line

DIAGNOSIS OF MALODOR

Patient’s History

- Patient should be asked to describe the type of smell that is being noticed. Depending on the origin, different smells may be distinguished.

Table 2: Different types of breath malodor according to their most likely origin (Preti et al, 1992; van Steenberghe, 2004) [8]

Type of Odor	Origin
Like rotten eggs	Indicates volatile sulfur compounds (VSC), which in most cases are associated with periodontitis or coated tongue.
Sweet (like dead mice)	Cirrhosis of the liver: besides VSC, aliphatic acids (butyric, propionic acid), methylmercaptan, ethanethiol, dimethyl sulphide accumulate.
Like rotten apples	Not well controlled insulin-dependant diabetes: accumulation of ketones
Like Fish	Kidney insufficiency or trimethylaminuria (very rare metabolic disease): uremia and accumulation of di- and trimethylamine

- Analyze whether it is halitophobia / pseudohalitosis.
- Analyze whether the bad breath is present only in the morning (temporary bad breath), after meals (due to certain foods or spices), or after lying down. Halitosis after meals or lying down may be indicative of regurgitation oesophagitis. [8]
- The clinician should ask about the frequency (e.g., every month), time of appearance with in the day (e.g., after meals can indicate a stomach hernia) etc.

One of the major challenges in judging halitosis is that self reported halitosis is quite subjective. Thus, it may be helpful if the patient is accompanied by candidate who is able to give more objective picture. For example, a spouse, friend or family members.

There are indirect routes to test your own breath.

Self examination [9]

- Lick your wrist, wait about five seconds while the saliva dries somewhat and then smell it. This experiment tells us about the smell of the anterior portion of the tongue.
- Take a spoon. Turn it upside down and use it to scrap the very back portion of the tongue. Now take a whiff of it. This experiment tells us about the smell of posterior portion of the tongue. This smell is probably the way your breath smells to others.
- Take a toothpick and introduce into the interdental area (area between teeth) and smell it.
- Spit saliva in a small cup or spoon. Allow it to dry for a few seconds and then smell it.

There are different methods an academic researchers test for bad breath, they are,

- Organoleptic Testing
- Instrument assessment

- Halimeter
- The BANA Test
- Utilizing Chemiluminescence
- Electronic Noses
- Dark Field or Phase- Contrast Microscopy

Organoleptic Testing [3,9]

- Gold standard for measuring halitosis is organoleptic testing. In this testing, the researchers are using their senses of smell i.e. their nose as the means for making the determination. Historically, this method has been a frequent choice among dental researchers. Noses are readily available, inexpensive to obtain and operate and to their credit, noses can detect up to 10,000 different smells. One of the problems associated with using this method is that it is not totally objective. Another is that factors other than just breath odors can and do influence organoleptic evaluations. Factors such as hunger, menstrual cycle, head position and the degree of attentiveness and expectation can each influence a judge's interpretation of what they smell.
- To assess halitosis, examiner should be trained and calibrated. To assess examiners differentiation abilities, test kits with different scents may be used (smell identification test). Further, these kits containing different dilutions of specific scents are available to assess and train differentiation strength of scents (Lang and Filippi, 2005). Sometimes, the examiner's smell may be impaired due to one's own halitosis, or temporary deterioration of smelling (example rhinitis).

Instrument assessment [9]

It has been used by dentist to study bad breath and definitely quantify the precise level of specific compound present in someone's breath. This device can analyze air, (incubated) saliva, or crevicular fluid for any component.

Halimeter [3,9]

- It is a specialized type of sulfide monitor and it produces a mean by which tester can quantify degrees of bad breath in parts per billion (ppb). These machines first introduced in 1991, measure the level of sulfide gas found in persons breath i.e. VSC'S. Halimeters showing high levels of sulfide suggest a correlating high levels of VSC although doesn't test for individual type of VSC's specifically.
- The examination should preferably be done after at least 4 hours of fasting and after keeping the mouth closed for 3 minutes. The mouth air is aspirated by inserting a drinking straw fixed on the flexible tube of the instrument. This straw is kept about 2cm behind the lips, without touching any surface and while the subject keeps the mouth slightly open and breathes normally.
- Absence of breath malodor leads to readings of 100 ppb or lower. Patients with elevated levels of VSC's easily reach 300-400 ppb

The BANA Test [10]

- Bacteria that produce bad breath can be detected by performing BANA test. Bacteria, in question have the characteristic of being able to produce an enzyme that degrades the compound BANA (benzoyl-D, L-arginine-naphthylamide). When sample of patient's saliva that contains these bacteria is placed in the BANA testing compound, they cause it to break down. As a result, the testing compound changes color. The results of a study by Kozlovsky A et al (1994) suggested that the BANA test, a simple, adjunct assay together with volatile sulphide determination which provides additional quantitative data contributing to the overall association with odor judge estimation.

Utilizing Chemiluminescence [11]

- One of the most recent methods for detecting the compounds associated with bad breath. Method was introduced in

1999. When a sample containing sulfur compound is mixed with the tests mercury compound, the resulting reaction causes fluorescence.

- These chemiluminescence detectors permit the precise measurement of nitrogen compounds such as indole & cadaverine in organic matrices. This helps to determine whether these nitrogen compounds are present in mouth air

Electronic Noses [12]

- Also called as Artificial Noses, are supposed to provide quantification and classification of exact smells (Shimura et al, 1997). Originally it was developed for quantitative assessment of smells in food or beverage. However, an application to diagnosis of halitosis appears reasonable.

Dark Field or Phase- Contrast Microscope [9]

- Gingivitis and periodontitis are typically associated with a higher incidence of motile organisms and spirochetes. These can be seen directly with the help of microscope

TREATMENT FOR ORAL MALODOR [13,14,15]

- Thorough brushing and flossing technique is needed in order to remove this plaque and any food debris
- Use of Tongue Scrapers or Tongue Brush
- Use of Interdental brushes
- Use of chemical mouth wash
 - A) Antibacterial mouthwashes
 - B) Mouthwash that neutralizes VSC's (e.g. Chlorhexidine. Halita, Essential oils, Chlorine Dioxide, Two- Phase Oil-Water Rinse, Triclosan)
 - C) Amine fluoride / Stannous Fluoride
 - D) Hydrogen peroxide 3%

Herbal remedies can also be used - Many natural products like yogurt, lemon water, mint leaves, vinegar, cardamom seeds are beneficial in curing bad breath.

MASKING THE MALODOR ^[16]

Treatment with breath mints, mint containing lozenges, drops, mouth sprays, and chewing gum is another pathway to increase the solubility of malodorous compounds in the saliva.

These products when used alone are not as effective as when used in conjunction with tongue cleanser, toothbrushes and flossing, especially when they contain agents that have the ability to neutralize VSC's.

CONCLUSION

Oral malodor (halitosis or bad breath) is an offensive odor of oral cavity and may disturb interpersonal communication and social activities. Factors associated with oral malodor were oral hygiene, periodontal disease and oral dryness. Hence health education and preventive intervention; such as tooth brushing instruction, and treatment regimens targeting periodontal disease as well as tongue cleaning should be incorporated to reduce levels of these compounds in mouth air and are satisfactory for cosmetic treatment.

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