

## Halitosis is a Term Derived from Latin Halitus (Breath)

Anil Melath<sup>1</sup>, Subair K<sup>2</sup>, Arjun MR<sup>3\*</sup> and Nayanika Shajan<sup>4</sup>

<sup>1</sup>Principal And HOD Of The Department Of Periodontics And Implantology Mahe Institute Of Dental Sciences And Hospital

<sup>2</sup>Professor Department Of Periodontics And Implantology Mahe Institute Of Dental Sciences And Hospital

<sup>3</sup>Reader Department Of Periodontics And Implantology Mahe Institute Of Dental Sciences And Hospital

<sup>4</sup>Nayanika Shajan Final Year Student At Mahe Institute Of Dental Sciences And Hospital

**\*Corresponding Author:** Arjun MR, Reader Department Of Periodontics And Implantology Mahe Institute Of Dental Sciences And Hospital.

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### Abstract

Halitosis is a term derived from Latin halitus (breath) and Greek suffix oias (condition) in English it means bad breath. Halitosis or oral malodor is an offensive odor originating from oral cavity leading to anxiety and physiological embarrassment. Intraoral conditions like insufficient dental hygiene, periodontitis or tongue coating are considered as important cause of halitosis. Management mainly includes simple measures like scaling and root planning. Intraoral factors induce 80 - 90% of halitosis with coated tongue, periodontal pathologies and poor oral hygiene practice being predominant cause. Total 10 - 20% of halitosis induced by extra oral halitosis associated with systemic disease. Increased medical awareness is needed to determine the actual pathophysiological process of oral malodor. These steps are necessary considering oral malodor can cause significant psychological concern of patient and their families.

**Keywords:** Halitosis; Halitus (Breath); Oral Malodor

### Introduction

Halitosis is a term derived from Latin halitus (breath) and Greek suffix oias (condition) in English it means bad breath [1]. Halitosis or oral malodor is an offensive odor originating from oral cavity leading to anxiety and physiological embarrassment [2]. Intraoral conditions like insufficient dental hygiene, periodontitis or tongue coating are considered as important cause of halitosis [3]. Management mainly include simple measures like scaling and root planning [4].

### Etiology

Halitosis can be due to intraoral and extraoral causes. Intraoral conditions are the cause of 80 - 85% of halitosis [5]. Halitosis can be due to:

- Local factors of non pathological origin.
- Systemic factors of non pathological origin.
- Administration of drugs.
- Xerostomia [6].

In 85% of patients with odor, the problem was found to originate from bacterial activity in oral cavity [7]. Most likely cause of halitosis is accumulation of food debris and dental bacterial plaque in teeth and tongue resulting from poor oral hygiene and resultant gingival and periodontal inflammation. Presence of high amount of salivary volatile sulphur compounds and increased tongue coating has seen to cause halitosis [8]. In addition to this other contributing factors that significantly causes halitosis are reduced salivary rate, stress, smoking, mouth breathing, low amount of water, tea, coffee or alcohol consumption [9]. Extraoral halitosis can be divided into non blood bore and blood bore halitosis. In extraoral blood bore, the malodor is emitted by the lungs and originates from nasal, paranasal or laryngeal reasoning or the pulmonary or upper digestive tract [10].

### Classification

According to new classification method, halitosis can be classified into genuine halitosis, pseudohalitosis and halitophobia. Genuine halitosis can be unclassified into oral and extra oral pathological halitosis. This classification helps clinician to diagnose the physiological condition [11].

Pseudohalitosis - patient complains of halitosis without the actual existence and can be treated by dental practitioner by counseling and simple oral hygiene procedure.

Halitophobia - patient presents with symptoms of halitosis in the absence of objective oral malodor [12].

New classification based on etiology:

- Type 1- Oral
- Type 2- Airway
- Type 3- Gastroesophageal
- Type 4- Blood bore
- Type 5- Subjective.

**Type 1:** The gases that contribute to type 1 halitosis are volatile sulphur compounds, volatile organic compounds, nitrogen containing gases. In halitosis patient, 30 most abundant volatile organic compound in mouth are alkanes and alkane derivatives. Other possible causes are periodontal diseases, gingivitis, large carious cavities, blood/thrombi.

**Type 2:** Originates from respiratory tract itself anywhere from nose or alveoli. Odorous gas produced by respiratory pathogens are held in exhaled breath and expressed via nose and breath.

**Type 3:** It is leakage of volatiles from stomach via the oesophagus to mouth and nose. Pathological level of gastroesophageal halitosis is said to occur due to:

- GERD
- *H. pylori* related gastritis
- Gastrocolic fistula, Zenker diverticulum and hypo pharyngeal diverticulum.

**Type 4:** Is where the volatile chemical in systemic circulation can transfer to exiled breath during alveolar gas exchange and causes halitosis.

**Type 5:** Subjective halitosis is a halitosis complaint without objective confirmation of halitosis by others or halitometer reading. Type 5 can be misdiagnosed if there are measurement error or transient symptoms [13].

### Microbiology/microbes in dentistry

Tongue is the primary source of malodor relative of periodontal pockets found in periodontal disease. Tongue is colonized by bacteria immediately after birth by anaerobe species like *Prevotella melaninogenica* and *F. nucleation* can be detected prior to tooth eruption. Presence of *T. denticola* and *Selenomonas* species increases at time of primary eruption of teeth [14]. The human oral cavity microbes is an ecosystem consisting of various symbiotic microbes. The basic oral microbiota consist phyla such as *Firmicutes*, *Proteobacteria*, *Fusobacteria*, *Bacterioides* and *Actinobacteria*. The important genera are *Streptococcus*, *Veillonella*, *Neisseria*, *Haemophilus*, *Prevotella*, *Fusobacterium*, *Leptotrichia*, *Porphyromonas* [15].

### Diseases causing halitosis [16,17]:

- Sinusitis: *Streptococcal pneumonia* and *Haemophilus influenza* are the main responsible bacteria. when purulent discharge is produced odor occurs.
- Atrophic rhinitis: Inability of nasal mucosa to clean itself because of atrophic change with ciliary distribution. A foul odor (oznea) results.
- Syphilis: Synthesis of nose can cause halitosis by gumme formation.
- Adenitis: Nasal passage gets obstructed on the malodor is due to pus production.
- Hypermethioninemia: Halitosis due to circulation of odiferous compounds in blood stream.
- Trimethylaminuria: Rotten fish odor is due to a genetic defect in activity of flavin mono-oxygenase due to treatment with drugs like choline resulting in excess in trimethylene.
- Diabetic ketoacidosis: Fruity odor.
- Chronic renal failure: Uremic fetor-uriferous odor from breath of patient.
- Liver failure or hepatic encephalopathy: Sweet ammoniacal or musty odor from urine and breath of the patient.

### Drugs causing halitosis [18]

Following drugs are directly responsible for oral malodor:

- Dimethyl sulphoxide: Odor and taste in mouth similar to garlic due to pulmonary excretion of small percentage of dimethyl sulphoxide as methyl sulphide.
- Cysteamine: Used to treat patients with nephropathic cystinosis and can be metabolized to dimethyl sulphide a malodor compound stable in blood.
- Nitrates and Nitrites: Used to treat angina and chest pain caused by heart disease. Anaerobic bacteria reduce nitrates into nitrites and some of these nitrites are reduced to nitric oxide which reacts with foul smelling volatile sulphur compounds.
- Disulfiram: Used to treat alcohol dependence. Carbon sulphide is a product of metabolism of disulfiram, it is stable in blood and can be transported from blood into alveolar air and breath. Acetone is a product of normal metabolism and appears in breath of all individuals but disulfiram increases acetone level in blood.
- Penicillamine: Drug used for rheumatoid arthritis. It is degraded product of penicillin antibiotics. Microbial degradation of penicillamine produces hydrogen sulphide and sulphhydryl anion, it decreases the redox potential within biofilm, and raises the pH favoring growth of gram negative bacteria. Bacterial interaction with specific substrate biotransform them into odorous compound that may cause oral malodor.
- Sulplatast tonsilate: Dimethyl sulphide metabolized from this drug is a cause of halitosis due to volatile dissolved into blood and exhaled through alveolar gas exchange.

### Diagnosis of halitosis [19,20]

- Organoleptic measurement: It is the golden standard for measuring and assessing bad breath. It is based on smelling the exhaled air of the mouth and nose and comparing the two.
- Gas chromatography: Using gas chromatography, we can measure volatile sulphur compound. In this method, the patient closes the mouth and hold air for 30s, then mouth air is aspirated using a gas light syringe. After collection of sample, it is injected to graph chromatocolumn at 70 degree C. The disadvantage of this method is that it is time consuming expensive and require skilled operator.
- Sulphide monitoring: To avoid the disadvantage or problems of gas chromatography, a new portable device which is a sulphide monitor was developed. In this method, patient should close the mouth and refrain from taking food for 5minute prior to measurement, then a disposable tube of sulphide monitor is inserted into patients mouth to collect air. Sulphur containing compounds in breath can generate electro-chemical reaction. This reaction is related directly with the use of volatile sulphur containing compounds.

### Treatment of halitosis [21]

Effective teeth cleaning, including brushing and interdental flossing can reduce oral malodor particularly in people with oral malodor. Chewing gums seems to lead to transient reduction on oral malodor. Mouth washes can be used, it acts by reducing either the bacterial load or associated odoriferous compounds. Chlorhexidine gluconate produce a fall in bacteria that produces volatile sulphur compound. Other mouth washes that reduce malodor includes cetylpyridinium chloride, chlorine dioxide and zinc chloride. Triclosan has direct action against volatile sulphur compounds and they are used in mouth washes and tooth paste.

### Conclusion

Intraoral factor induce 80 - 90% of halitosis with coated tongue, periodontal pathologies and poor oral hygiene practice being predominant cause. Total 10 - 20% of halitosis induced by extra oral halitosis associated with systemic disease. Increased medical awareness is needed to determine the actual pathophysiological process of oral malodor. These steps are necessary considering oral malodor can cause significant psychological concern of patient and their families [22].

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