

REVIEW ARTICLE

HALITOSIS: A PSYCHOLOGICAL TROUBLE FOR THE PATIENT

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ABSTRACT:

Halitosis causes a distressing effect on confidence and personality of a person and may affect so terribly that person may avoid socializing. This article reviews the aetiopathogenesis and management of halitosis. Thus, the present review is an effort to increase the depth of knowledge of diagnosis and management of halitosis among dentists.

Keywords: Oral malodour; Halitophobia; Intraoral; Extraoral

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INTRODUCTION

Halitosis is an unpleasant or offensive smell emanating from the breath.¹ The word halitosis is a latin word, derived from halitus meaning breathed air and the word osis meaning pathologic alteration.² In the literature, the other available terms for halitosis are foetor ex ore, breath odor, bad breath, oral malodor and offensive breath.³

People interact with each other every day, and halitosis has a negative effect on a person's social life. The person who has halitosis may not be aware of this situation because this person may have developed tolerance or olfactory disturbance. Due to this cause, the patient generally cannot identify his/her halitosis and it is identified by his/her partner, family member, or friends. This condition causes a distressing effect on persons who have halitosis and so the affected person may avoid socializing.² Despite of the source of oral malodor, chronic breath problems can be detrimental to one's personality and confidence causing social, emotional and psychological anxiety.⁴ Thus, the present review is an effort to increase the the depth of knowledge of diagnosis and management of halitosis among dentists.

AETIOLOGY

The basic pathophysiology is microbial degradation of organic substrate giving off volatile gases. The factors that support the growth of these organisms and predispose to halitosis includes accumulation of food in periodontal pockets,

dorsum of the tongue or in the tonsillar crypts, diminished salivary flow, mucus in throat and sinuses.⁵ It has also been shown that dorsum of the tongue posterior to circumvallate papillae consistently carry highest load of bacteria contributory to halitosis.⁶ Anaerobic, mainly Gram-negative, bacteria are involved in the degradation of organic substances e.g., saliva, food debris, desquamated epithelial cells into primarily volatile sulphur compounds (VSCs).³ Although other organic components such as organic acids, indole/skatoles, putrescine, cadaverine may be involved in the production of halitosis, however predominate VSCs responsible for oral malodour are hydrogen sulfide (H₂S), methyl mercaptan (CH₃SH), and dimethyl sulphide [(CH₃)₂S].⁴

The other intra-oral causes are open caries lesions, inadequate dental restorations, periodontitis, local infections such as pericoronitis, periimplantitis, or candidiasis as well as poor oral and denture hygiene.³ Takeuchi H et al⁷ evaluated the association between oral malodour and periodontal disease, and found that levels of volatile sulphur compounds and periodontal parameters increased according to the severity of oral malodour.

In addition to this, other contributing factors that significantly persuades halitosis are reduced salivary flow rate, stress, smoking, mouth breathing, unbalanced diet, low daily amount of water, and beverages such as tea, coffee or alcohol consumption.³

Various studies revealed that over 90% causes of halitosis originate from oral cavity.⁸ This is

because the oral cavity harbours a large variety of microorganisms which include a large group of Gram-positive bacteria mainly Streptococci and a group of anaerobic microorganisms such as Porphyromonas gingivalis, Fusibacterium nucleatum and Prevotella intermedia. Among the latter, many are Gram-negative oral bacteria whose proteolytic activity is associated with oral malodour and periodontal disease. Other bacteria associated with gingivitis and/or periodontitis (viz-

Actinobacillus actinomycetemcomitans, Campylobacter rectus, Peptostreptococcus micros, Bacteroides forsythus, Eubacterium species and Spirochetes) are known to produce large amounts of volatile sulfur compounds (VSC) which are malodorous.⁹

Troger B et al¹⁰ evaluated the emotional impact of halitosis on 18-year-old men using a self-reported questionnaire and reported that findings were associated with low income and lower level of education. Halitosis leads to changes in the behavior and social life of those affected by it.

However, if a non-oral source of halitosis is present, it generally attributes to systemic problems such as diabetes, liver and kidney disorders and pulmonary disease and/or medications, especially those that decrease salivary flow such as antidepressants, antipsychotics, narcotics, decongestants, antihistamines, and antihypertensives.⁴

TYPES OF HALITOSIS

Halitosis is divided into intraoral, extraoral, pseudohalitosis and halitophobia. Intraoral halitosis, responsible for 85% of the cases of halitosis, is subdivided into physiologic (genuine) halitosis or pathologic halitosis. Extraoral halitosis occurs when malodor appears with no oral cause, as in the case of pulmonary causes. Both patients with pseudohalitosis and halitophobia present with complaints of halitosis, but without any diagnostic evidence of malodor.¹⁰

Real or Genuine halitosis: Obvious malodor with intensity beyond socially acceptable level and/or affecting personal relationships.^{3,11}

Temporary halitosis: Malodor caused by food and dietary factors such as garlic or morning bad breath.

Intra-oral halitosis :The source lies within the mouth. The origin is often a coating on the dorso-posterior region of the tongue and/or a pathologic condition or malfunction of oral tissues (e.g., periodontal disease). The condition is influenced by co-factors (e.g., medication, smoking, stress).^{3,12}

Extra-oral halitosis (blood-borne): The source lies outside the mouth. The malodor is emitted via

the lungs and originates from disorders anywhere in the body (e.g., hepatic cirrhosis)

Extra-oral halitosis (non-blood-borne): The malodour originates from nasal, paranasal, or laryngeal regions, or the pulmonary or upper digestive tract

Psychogenic halitosis: Obvious malodor is not perceived by others but the patient complains of its existence. No physical or social evidence exists for the presence of halitosis.³

Pseudo-halitosis: Breath malodour that cannot be verified objectively. The patient initially thinks that they have malodour but there is no objective evidence of it. Patient eventually accepts that they do not have malodour.¹² Condition is improved by counselling and simple oral hygiene measures.

Halitophobia: The patient persists in believing they suffer from halitosis even after treatment of halitosis or pseudo-halitosis.^{3,11}

METHODS TO ASSESS HALITOSIS

The three main methods of analyzing oral malodour are organoleptic measurement, gas chromatography (GC) and sulphide monitoring. Organoleptic measurement is a sensory test scored on the basis of the examiner's perception of a subject's oral malodour. GC, performed with apparatus equipped with a flame photometric detector, is specific for detecting sulphur in mouth air. GC is considered the gold standard for measuring oral malodour because it is specific for volatile sulphur compounds (VSC), the main cause of oral malodour.^{2,11} The additional measurement methods are BANA test, chemical sensors, salivary incubation test, quantifying beta-galactosidase activity, ammonia monitoring and ninhydrin method.¹ The BANA test is practical for chair-side usage. It is a test strip which composed of benzoyl-DL-arginine-a-naphthylamide and detects short-chain fatty acids and proteolytic obligate gram-negative anaerobes, which hydrolyze the synthetic trypsin substrate and cause halitosis. It detects especially *Treponema denticola*, *P. gingivalis*, and *T. forsythensis* that associated with periodontal disease.²

MANAGEMENT

A complete medical, dental and halitosis history are very crucial for planning the treatment approach for the patient. The medical history provides information on current medications as well as systemic diseases and dental history assesses the frequency of dental visits, the presence and maintenance of dental prosthesis along with oral hygiene practices followed by the patient. The presence of nasal obstruction, mouth breathing, allergy, tonsillitis, tonsilloliths, dysphagia,

previous ear, nose and throat encounters, types of food typically eaten should be enquired.³

Explanation of halitosis and instructions for oral hygiene i.e. support and reinforcement of a patient's own self-care for further improvement of their oral hygiene should be given. In case of pathological halitosis with oral cause, patient should be advised for oral prophylaxis, professional cleaning and treatment for oral diseases, especially periodontal diseases. If the cause is extraoral, patient should be referred to a physician or medical specialist.¹¹ Takeuchi H et al⁷ determined the effect of periodontal therapy on oral malodour and concluded that periodontal therapy combined with tongue cleaning is beneficial for oral pathogenic halitosis.

Silveira et al¹³ demonstrated that a strict supragingival plaque control reduces VSC and organoleptic scores in Periodontitis patients. Kara C et al¹⁴ investigated the impact of oral hygiene instructions and scaling on halitosis and found that Oral malodour levels were significantly reduced after treating gingival inflammation. Thus foregoing data concludes that periodontal health and halitosis are associated with one another.

Patients with pseudo-halitosis mistakenly believe that other individuals' avoidance behaviours are caused by their own oral malodour. Hence, these patients need to be counselled, with literature support, education and explanation of examination results, that the intensity of their malodour is not beyond a socially acceptable level. This step in patient management is most important in differentiating pseudo-halitosis from halitophobia. Pseudo-halitosis patients generally respond favourably because they can accept the counselling. Patients who cannot accept their perception of malodour as a mistaken belief are classified as halitophobic and need assistance from a psychological specialist.¹¹

Chewing gum, parsley, mint, cloves or fennel seeds, and the use of proprietary fresh breath preparations may help patients in esteeming. Cosmetic nonpharmacological methods, such as chewing gums, mints, flavored sprays, and some mouth rinses, however, merely provide a competing and temporary smell that may mask the unfavourable odor.¹⁵ Use of appropriate regular oral hygiene procedures, which include regular tooth cleaning (brushing and interdental flossing) and the use of antimicrobial toothpastes and / or mouthwashes. Generally, it is recommended that mouthwashes should be used two or three times daily for at least 30 s. Mouthrinses containing chlorine dioxide and zinc salts have a substantial

effect in masking halitosis, not allowing the volatilization of the unpleasant odor.¹⁶

Niles HP et al¹⁷ evaluated clinical effectiveness of toothpaste containing triclosan and a copolymer and found that these dentrifices provide effective control of breath odor at 12 h after brushing the teeth. Similarly Sharma NC et al¹⁸ also conducted a similar study and concluded that Colgate Total dentifrice provides effective control of breath odor at 12 hours after brushing the teeth.

Emergent treatments include probiotics and vaccines targeted against causal micro-organisms or their products.¹⁵ Kang et al¹⁹ revealed the capacity of various strains of *W. cibaria* to inhibit the production of volatile sulphur compounds by *F. nucleatum* and also found that gargling with a solution containing *W. cibaria* was associated with a net reduction in the production of hydrogen sulphide resulting in reduction in bad breath. Similarly, Burton JP et al^{20,21} reported that the use of gum or lozenges containing *S. salivarius* K12 (BLIS Technologies Ltd., Dunedin, New Zealand) reduced levels of volatile sulphur compounds among patients diagnosed with halitosis.

Adewole RA et al¹ claimed that limitation of successful treatment of halitosis by dentists includes patients' non-compliance with oral health instructions, patients' psychological factors (halitophobia, depression, anxiety) which requires a collaboration between dentists and psychiatrists and poor knowledge of update on halitosis. Patients' noncompliance with instructions and appointment is a general problem in developing countries due to less education, low socio-economic status and less level of dental awareness among patients.

CONCLUSION

The present review of the foregoing data reveals that halitosis results in loss of self esteem followed by psychological disturbance and thus influences daily life of the patient. Management of halitosis should be an interdisciplinary effort among dental specialists, psychologists/psychiatrists and medical practitioners, a collaborative approach should be encouraged to afford the patients a high success rate. Since the oral cavity is the source of halitosis in most of the cases, thus a dental practitioner should be the first person to contact

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