

Oral malodour

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Abstract

Oral malodour may affect up to three billion people worldwide, with millions of dollars spent on treatment. Halitosis is often used synonymously, but oral malodour is the preferred term for any bad breath emanating from the mouth. Oral causes account for the majority of bad breath cases. It is the objective of this article to review the causes, classification and treatment of oral malodour for health care workers.

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Introduction

Bad breath or oral malodour (OM) affects up to three billion people worldwide, with some reports putting the prevalence as high as 50%.¹⁻² It is the third most common reason for visiting a dentist. Halitosis is the term most often used to describe bad breath, regardless of its actual origin.³ It is recommended OM be used to describe bad breath originating from the mouth.³⁻⁴ Every year, over \$500 million (R3.5 billion) is spent in the USA alone on mouthwashes, sprays and over-the-counter products in an attempt to combat this problem.² Oral causes are implicated in the majority of cases (87%) with ear-nose-and-throat causes making up most of the rest.⁵⁻⁶ Systemic causes of OM are extremely rare.⁷ This article will outline a logical approach to halitosis or OM management.

Common causes of halitosis or oral malodour

Even though the inclusion of garlic and onions in the diet is a common cause of bad breath, the effect is temporary and does not warrant treatment over and above normal oral hygiene measures such as brushing and flossing.⁴ OM proper is caused by the action of bacteria on organic substrates in the oral cavity, with volatile sulphur-containing compounds (VSCs) the most important end product of this breakdown process.⁸ Therefore any local factor that favours the growth of bacteria in the oral cavity will be a risk factor for OM. Such conditions include tongue coating, periodontal disease ('gum disease'), peri-implant disease, deep dental cavities, impacted food, imperfect dental restorations, unclean dentures and factors that cause a decreased salivary flow rate.^{7,9-12}

The evidence that implicates bacteria in the pathogenesis of OM can be viewed as fourfold:

1. In vitro and in vivo studies have demonstrated that the combination of organic substrates and bacteria produces the odorous compounds.^{8,13-14}
2. OM is successfully managed by reducing the substrates and micro-organisms by mechanical methods such as tooth brushing and tongue scraping.⁴
3. Antibacterial agents reduce halitosis.¹⁵
4. Patients with periodontal disease show more OM than healthy subjects and there is an increase in the OM with increasing severity of the periodontal disease.^{3,16}

The clinical distinction between oral and non-oral causes of OM is made by determining the source of the malodour. This is best done by the organoleptic method, whereby the examiner smells the patient's breath.⁴ Patients are notoriously bad at identifying their own OM. It is therefore important to have a third person present at the examination, preferably a caring relative or friend, who can give an objective opinion regarding the malodour.⁷

A simple technique to distinguish between oral and extra-oral malodour is to close the patient's nose and smell the breath from the mouth, and repeat the exercise by closing the mouth and smelling the breath from the nose. This will distinguish between upper respiratory malodour (if the smell is present in nose breath only), lower respiratory/stomach origin (if the smell is present in both) and oral origin (if the smell is present in mouth breath only).⁷ Although there are measuring instruments for OM, these are expensive, often cumbersome and not suited to private practice settings.⁴

The Halimeter[®] is the exception and is a portable monitor that measures VSCs in the mouth, and specifically hydrogen sulphide.⁴ A value obtained by the Halimeter[®] does not necessarily correspond to organoleptic scores because other



Figure 1: Coated tongue, due to insufficient brushing or scraping of the dorsum



Figure 3: Swollen, red gums, with some visible bleeding

compounds may contribute to the malodour, and therefore the Halimeter® may result in false negatives.⁴ However, it may be a useful device to objectively quantify halitosis in practice and to monitor patients on treatment.

Extra-oral causes that should be investigated include disturbances of the upper respiratory tract (sinusitis and tonsillitis), disturbances of the gastrointestinal tract, systemic diseases (hepatic or renal failure), metabolic disorders (diabetes mellitus) and lung carcinoma.¹⁷ Systemic causes will, however, be rare exceptions.⁷

As the aetiology of the OM will influence the management approach, it is imperative that the correct diagnosis be made. A thorough medical and dental history is important, including the history of the OM. This should also include information about diet and confirmation of the OM by someone other than the patient.^{7,15} Messadi and Younai provide a very useful examination form for this purpose in their paper on halitosis.⁴

Identification of a possible aetiology:

1. Unclean dentures and a coated tongue are fairly easy to diagnose. Direct inspection of the tongue will reveal a coated tongue (see Figure 1) whereas dentures, if present, can be inspected for general cleanliness.
2. A dry mouth will generally be easy to determine from history taking, with patients complaining of difficulty when swallowing, eating or talking. The dorsum of the tongue will generally appear dry and smooth or shiny (see Figure 2).



Figure 2: Smooth tongue with loss of papillae and dry shiny appearance



Figure 4: Red marginal gums with visible pus (arrows) after pressure was applied

3. Periodontal or gum disease is a disease of the tissues surrounding the teeth and is one of the main causes of OM.^{3,9-10} Periodontal disease will generally be difficult to diagnose outside a dental setting. There are, however, signs and symptoms that might point any health care worker in the right direction, namely red and swollen gums (see Figure 3), a history of bleeding when brushing or spontaneous bleeding (blood on the pillow in the morning is normally seen in advanced gum disease), spaces appearing between teeth as they move apart and teeth appearing longer due to receding gums. Loose teeth are seen in advanced periodontal disease and are a frequent complaint of such patients. Patients can also be asked about a bad taste when 'sucking' on the gums, indicating the presence of pus emerging between the gums and teeth (see Figure 4).
4. Dental implants have become very commonplace. According to a consensus report of the Sixth European Workshop on Periodontology, up to 80% of patients may have infection around dental implants.¹⁸ These bacteria live in and around the dental implants and can cause significant OM. This can only be assessed by a dental professional with the aid of intra-oral radiographs and dismantling of the implant prosthesis. A thorough dental history should reveal the presence of dental implants in the mouth.

Classification of oral malodour

Different categories of OM can be identified based on the actual presence of OM or the patient's misperception thereof. If OM is perceived by others and exceeds a socially 'acceptable' standard, it is classified as genuine OM. However, if the patient mistakenly believes that he or she suffers from OM due to the misinterpretation of social cues, it is termed pseudo-OM. Lastly, if the patient persists in his or her complaint of OM even after successful management of genuine or pseudo-OM and there is no evidence of OM, the case is best described as halitophobia.¹⁹

One of the most common occurrences of OM is 'morning breath'. This is, however, a physiological condition caused by reduced salivary flow at night and the accumulation of desquamated epithelial cells and bacteria in the mouth. The condition is easily rectified by oral hygiene procedures, eating, or drinking water on awakening.²⁰

Treatment of halitosis

As bacteria are at the root of the problem, reduction of the oral bacterial load is a first line of treatment. This can be achieved as follows:

1. Mechanical reduction of both the bacteria and the organic substrates, which can be accomplished through a solid breakfast, sugar-free chewing gum, brushing and flossing of the teeth, tongue cleaning with a brush or tongue scraper and professional cleaning by a dental professional.^{8, 15-16} As periodontal disease is one of the most frequent causes of OM,³ the teeth should be examined by a health care worker and if periodontal disease is suspected, the patient should be referred to a dentist or a specialist periodontist.
2. Chemical reduction of the bacterial load. Mouthwashes and dentifrices can be used to lower the bacterial load. Patients should be informed that a mouthwash will be an aid, together with mechanical removal, in the reduction of the bacterial load but, on its own, will not be able to treat this complex problem effectively. Mouthwashes usually contain chlorhexidine, triclosan, cetylpyridinium chloride and essential oils.¹⁵ The reader is referred to a recent review of mouthwashes for the South African health care worker.²¹
3. It should be pointed out that alcohol-containing mouthwashes should not be prescribed for extended periods of time, due to the possible relationship with oral cancer.²² It is also worth remembering that alcohol is by nature a desiccant and can lead to a sensation of dry mouth, which can create further discomfort.
4. Neutralisation of odorous compounds by chemical agents. Sodium bicarbonate has been used successfully in reducing OM¹⁵ and is now available in many types of toothpaste. There is no evidence yet that this will combat OM effectively, though.
5. Improving salivation or using a salivary substitute in cases of dry mouth.⁴ In South Africa, a few products are available in the form of mouthwashes and gels and the reader is again referred to a recent review on this subject for the South African health care worker.²¹

Managing extra-oral halitosis is more difficult, with evidence-based practises scarce.¹⁵ If it can be proven by a process of elimination that the tonsillar crypts are the source of the malodour, tonsillectomy may be indicated.²³

Conclusion

OM is a very common problem, yet one that is shunned by most health care workers, including dentists. This is probably partly due to the social stigma and embarrassing nature of talking about it. It is almost as if one insults a patient by mentioning the presence of OM. Health care workers should, however, be encouraged to openly discuss this problem with patients, as it could be an indicator of underlying local or systemic disease.

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