JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH

How to cite this article:
VANDANA K.L., SRIDHAR A. ORAL MALODOR: A REVIEW. Journal of Clinical and Diagnostic Research [serial online] 2008 April [cited: 2008 Apr 7]; 2: 768-773.
Available from
http://www.jcdr.net/back_issues.asp?issn=0973-709x&year=2007&month=April&volume=2&issue=2&page=768-773&id=194

REVIEW

Oral Malodor: A Review

VANDANA K.L., SRIDHAR A.,

ABSTRACT

Breath malodor is a condition that health and social implications. The origin of oral malodor problems are related to both systemic and oral conditions. This paper provides a comprehensive review of the etiology of breath odor, its prevalence, diagnosis and treatment strategies for this condition.

Key words: Oral malodor, Breath malodor, Halitosis, Volatile Sulphur compounds, pseudo halitosis, Halitophobia, Organoleptic.

Address for correspondence:
Dr. Vandana k.l., senior professor, Department of periodontics, college of dental sciences, davangere-577004.
E-mail: vanrajs@hotmail.com. Phone: 08192-221316.

Introduction

It is likely that the majority of adults suffer from bad breath at least occasionally. Since bad breath usually comes from the mouth itself, the dentist should be the first professional whom individuals turn for help. In recent years, there has been a growing awareness that bad breath is a problem that the dental profession should recognize and address. Oral malodor is a phenomenon that is often oversimplified by the commercial dental industry, misunderstood by the general society, and not completely understood by the scientific community.

Bad breath has been recorded in the literature for thousands of years. The prophet Mohammed is said to have thrown a congregant from the mosque for having the smell of garlic on his breath. Malodor has been documented in the Bible, along with attempted remedies for treating it. The aetiologies of oral malodor are quite diverse. There are some patients whose oral malodor stems from psychological problems. These problems manifest either as a syndrome or simply a transitory perception of malodor. Aside from the pure psychological component, there is also socio-economic component that affects the perceived

need for fresh breath and the heightened awareness of one's breath. There are many devices available to measure volatile Sulphur compounds (VSCs). Despite these devices, oral judges still are employed for the assessment of oral odor.

There exist within the mouth many reservoirs (dorsum of the tongue, periodontal pockets, denture surfaces etc.) for bacteria. These are the areas where hygiene can be applied in an attempt to lessen the amounts of gases released by these bacteria.

The purpose of this review paper is to review the factors relating to oral malodor and to express the psychological aspects along with various aetiology, diagnostic and treatment modalities .

Psychological and socio-economic aspects of malodor:

Among our many senses, smell is considered to be one of the more subjective, and it is open to emotional and cognitive influence. Smell can influence and be influenced by mood, lending a great deal of sensitivity. Because perception can skew or Among our many senses, smell is considered to be one of the more subjective, and it is open to emotional and cognitive influence. Smell can influence and be influenced by mood, lending a great deal of sensitivity. Because perception can skew or alter our awareness, many people may not think that they have "bad breath" until they may suffer from imaginary halitosis due to presumptions based on attitudes of other people.

In some situations it is in the individual's perception of malodor which is not detectable by others which can be described as an actual syndrome. It was shown that certain personalities co-relate with the olfactory reference syndrome

such as those with abscessing features, inferiority complexes, neuroticism, self criticisms, self observation, shyness and difficulty in expressing emotion. The impact of halitophobia can be minute or very deleterious, because some people go so far as to avoid social events, keep what are thought as safe distances from others and even talk sideways when engaged in conversation.

Seeing the importance to the individuals and the amount of time, money and energy expended, it is important that the scientific community do its best to help individuals who suffer from oral malodor or its related psychosis.

Considering these findings, it is important to understand the psychological component in perceptions of oral malodor. This prompts a need for psychological evaluation when treating patients for this disorder. The evaluation should be given significant weight when planning treatment for these patients. Expectation and perceptions of results are multifactorial for these patients, and thus very subjective. This complexity is an obstacle both in diagnosis and treatment, yet it may also serve as an avenue of treatment that should be addressed by the medical community, in particular the psychological specialties.

Definitions:

Halitosis: Halitosis is the general term used to describe any disagreeable odor in expired air, regardless of whether the odorous substances originate from oral or non-oral sources. (Tangerman A 2002)

Halitosis: Halitosis is the general term used to describe any disagreeable odor in expired air, regardless of whether the odorous substances originate from oral or non-oral sources. (Tangerman A 2002)

Oral malodor: oral malodor specifically refers to such odor originating from the oral cavity itself. (Jan Lindhe 2003)

Prevalence of halitosis:

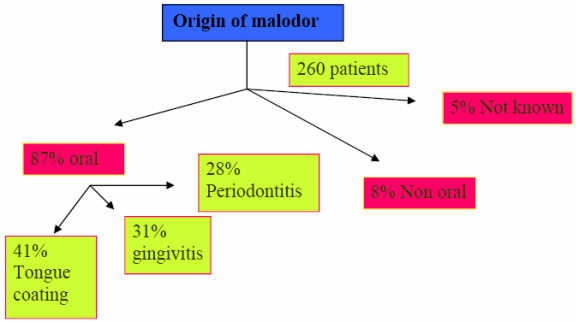
It is very difficult to determine the exact number or percentage of the population who have oral malodor, since there is a lack of epidemiological studies that address this issue. However, there are no universally accepted standard criteria, objective or It is very difficult to determine the exact number or percentage of the population who have oral malodor, since there is a lack of epidemiological studies that address this issue. However, there are no universally accepted standard criteria, objective or subjective methods that can define and /or detect halitosis. In a study done in United States involving individuals older than 60 yrs found 24% had oral malodor [1]. In another similar study in Japan population involving about 2,672 individuals, 6-23% of subjects had oral malodor (VSCs) in expired at some period during the day [2].

Classification of halitosis(Yaegaki K & Coli M 2000) [3]

I. 1) Pseudo halitosis.
   2) Genuine halitosis.
- Physiologic
- pathologic
   3) Halitophobia.

II. Halitosis due to local factors of pathological origin.
III. Halitosis due to local factors of non-pathological origin.
IV. Halitosis due to systemic factors of pathologic origin.
V. Halitosis due to systemic factors of non-pathologic origin.
VI. Halitosis due to systemic administration of drugs.
VII. Halitosis due to xerostomia.

Aetiology of malodor: (Delanghe et al, 1999) [4]



Oral causes: which include periodontal diseases like ANUG and periodontitis, dry sockets, ulcers, healing wounds, tongue coating like wise there are various factors have been shown to be associated with halitosis. But, selective relationship is not established.

Non-oral causes:

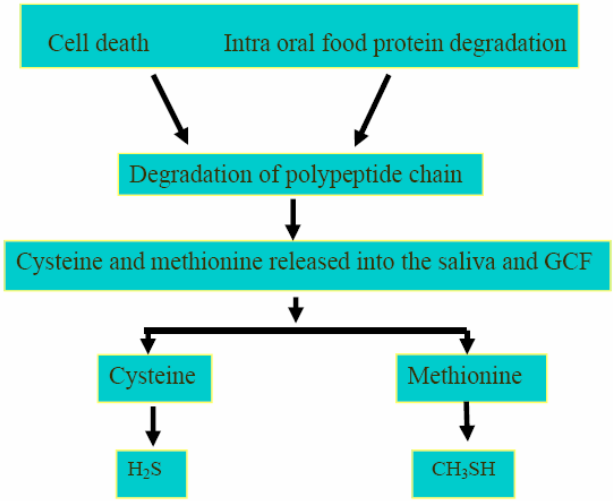
1. Ear-Nose-Throat: acute pharyngitis, purulent sinusitis, and post nasal drip.
2. Bronchi and Lungs: chronic bronchitis, bronchiectasis, bronchial carcinoma.

3. GIT: easophageal hernia (Zenker's diverticulum), gastric hernia, regurgitation easophagitis, intestinal gas production.
4. Liver: cirrhosis (increased ammonia).
5. Kidney: chronic glomerulonephritis (increased uric acid).
6. Systemic metabolic disorders.

Factors involved in the etiology of halitosis:

Halitosis is caused due to the presence of odorous gases in the air expelled from the oral cavity. The odorous compounds are mainly divided into;

1. Sulphur containing gases (VSCs).
    a. Hydrogen sulphide
    b. Methyl mercaptan
    c. Methyl sulphide
    d. Dimethyl disulfide
2. Non-Sulphur containing gases.
    a. Volatile aromatic compounds
    b. Organic acids (acetic and propionic acids)
    c. Amines (putrescine, cadeverine-20)



The role of bacteria in oral halitosis:

Oral microorganisms play an important role in the production of malodor. In the absence of microorganisms, the odoriferous compounds are not released. Mcnamara et al 1972 [5] using in vitro
methods demonstrated the formation of odor Oral
Oral microorganisms play an important role in the production of malodor. In the absence of microorganisms, the odoriferous compounds are not
released. McNamara et al 1972 [5] using in vitro methods demonstrated the formation of odor components from incubated saliva and correlated with a shift in the microflora from predominantly Gm +ve to Gm –ve anaerobic flora. Different authors have studied the in vitro capability of different bacteria to generate VSCs. Among the species capable of VSCs production are Peptostreptococcus, Eubacterium, Selenomonas, Centipeda, Bacteroides and Fusobacterium. In a study by Vandana K. L. et al 2006 [6] it was shown that there is a correlation between different microbial (Streptococcus, Fusobacterium, Prevotella, Bacteroides and Porphyromonas) colonies and difference in malodor levels.

Non-oral origins of bad breath:

Contrary to various beliefs among the lay community, most oral malodor stems from the oral cavity and not from other sources. In fact, 87% of cases are believed to stem from intra-oral sources, 8% from oto-rhino-laryngeal fields, and 5% from Contrary to various beliefs among the lay community, most oral malodor stems from the oral cavity and not from other sources. In fact, 87% of cases are believed to stem from intra-oral sources, 8% from oto-rhino-laryngeal fields, and 5% from unknown sources [4]. Odor coming from the GIT is confused unlikely, except for the occasional escape of air that was swallowed during consumption.

Other situations can arise in which accumulation of food and food debris in the pouch of the esophagus leads to the development of significant breath odor (Zenker's diverticulum). In occasions where gastric hernia is coupled with reflex Oesophagitis, a disturbing breath odor can manifest.

Diagnosis:

Much as in any other diagnosis, patient history and physical examination are valuable tools. Questions directly pertaining to the malodor should be related to 1) duration of the odor, 2) if it occurs at particular times during the day, 3) if others have Much as in any other diagnosis, patient history and physical examination are valuable tools. Questions directly pertaining to the malodor should be related to 1) duration of the odor, 2) if it occurs at particular times during the day, 3) if others have noticed it, 4) if it is completely self recognized and 5) whether the patient is taking any medications that cause dry

mouth. After ruling out non-oral causes, further investigation is warranted.

Organoleptic assessment of breath by a calibrated and tested judge is still considered to be the best method of evaluating oral malodor and is the most common method of evaluation employed in diagnosis. Other useful tests include the BANA (Benzoyl-DL-Arginine-Naphthylanine) test, as well as those with gas chromatography and portable VSC measuring devices.

The BANA test appears to be a useful adjunct test in the determination of oral malodor. The studies conducted by Vandana K. L. et al 1997 [7] and 1998 [8] utilized the BANA test kit (BANA Scan Oral B, USA) and the studies concluded that the test kit is effective in identifying the main odoriferous periodontal microorganisms (Porphyromonas gingivalis and Bacteroides forsythus). Gas chromatography is another of the instrumental analysis available for the evaluation of oral malodor. This method allows for actual characterization of the volatile compounds involved in the malodor. This method is considered to be superior to the VSCs tests in that it picks up many of the volatile non-sulphorous molecules that exist in malodor.

There are many other portable VSC monitors that are compact and relatively inexpensive. As the mouth air is expired, the devices measure the amount of VSCs, regardless of type and continue to provide a value in the diagnosis. Few of them are Tanita breath alert, Osmoscope, Halimeter and diamond probe. Another chair side test kit (Hlitox reagent kit) measures the halitosis linked toxins. It is quick, simple colorimetric test that detects both volatile sulphur compounds as well as polyamines.
In a recent study done by Vandan K. L. & Mathew John 2006 [6] using Tanita breath alert, BANA and Halitox reagent kit have shown that Tanita breath alert can be a useful tool in self assessment of malodor which is currently not available in India.

Management:

Before any treatment is rendered, the source of the malodor must be identified. Then the exact treatment corresponding to the source should be employed. All situations with systemic origins should be treated by the appropriate specialist. If the Before any treatment is rendered, the source of the malodor must be identified. Then the exact treatment corresponding to the source should be employed. All situations with systemic origins should be treated by the appropriate specialist. If the source is of oral cavity, various treatment modalities include; 1) mechanical reduction of intra-oral nutrients and microorganisms (tongue cleaning. tooth brushing, interdental cleaning and professional periodontal therapy). 2) chemical reduction of oral microbial load (CHX mouth wash 0.2%, essential oil mouth wash, chlorine dioxide, two phase oil-water rinse, triclosan, fluorides, hydrogen peroxide and oxidizing lozenges etc.) 3) rendering malodorous gases non-volatile (metal salt solutions like ZnCl2, SnCl2, HgCl2, SnF2; Backing soda dentifrices etc.). 4) Masking the malodor (mouth sprays, lozenges and chewing gums containing volatiles with pleased odor).

Conclusion:

When looking at oral malodor, it is essential to understand that its origins are complicated. The influence of major corporations has resulted in heightened awareness of one's breath and that of others. The practitioner, when presented with malodor When looking at oral malodor, it is essential to understand that its origins are complicated. The influence of major corporations has resulted in heightened awareness of one's breath and that of others. The practitioner, when presented with malodor patients, must not discount any reports by the patient and should follow a course of diagnosis, treatment and follow-up that any other condition deserves. Patients also should be referred for psychological evaluation if a psychological component is suspected in the complaint of malodor.
As 87% of malodor is caused by oral diseases, proper referral to the dentists specifically periodontists is necessary because of its association with periodontal diseases. It has been established that the same bacteria are responsible for the damage seen in periodontal disease and production of great amounts of VSCs and these VSCs are believed to be toxic.
Various methods of self assessment are available for patients who are intended, also various methods of diagnosis for the practitioners. Many products and treatments are available to deal with "bad breath". Ultimately, with more research in the future, it will be possible to arrive at better diagnostic tools along with improved treatments and treatment options.

References

[1] Rosenberg M: Clinical assessment of bad breath. Current concepts. JADA. 1996; 127:475.
[2] Miyazaki H, Sakao S, Katoh Y, et al. Correlation between volatile sulphur compounds and certain oral health measurements in the general population. J Periodontol. 1995;66(8):679-84.
[3] Yeagaki K, Coli J.M. Examination, classification and treatment of halitosis; clinical perspectives. J Can Dent Assoc. 2000;66(5):257-61.
[4] Delenghe G, Ghyselen J, Bollen C, et al. An inventory of patient's response to treatment at a multidisciplinary breath odor clinic. Quintessence Int. 1999;30(5): 307-10.
[5] McNamara TF, Alexander JF, Lee M. The role of microorganisms in the production of oral malodor. Oral Surg Oral Med Oral Pathol. 1972;34(1):41-8.
[6] Vandana K.L. and Mathew Jhon. Detection and measurement of oral malodor in periodontitis patients. Ind J Dent Res. 2006;17(1):2-6.
[7] Vandana K.L, Kala M. The detection of Benzoyl-DL-Arginine-2-Napthylamide (BANA) hydrolase activity in adult periodontitis – A rapid enzymatic assay using perioscan. J Ind Soc Periodontol. 1997;21(2):23-26.
[8] Vandana K.L, Aparna B: The detection of BANA positive microorganism in adult periodontitis before and after the initial periodontal therapy using Perioscan – a rapid chairside diagnostic test. J Ind Dent Assoc. 1998; 69:75-80.