

Correlation of Oral Hygiene Habits, Smoking and Nutritional Habits with Halitosis

Eurasian Clinical and Analytical Medicine Original Research

Oral Hygiene Habits, Nutritional Habits and Halitosis

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Abstract

Aim: The aim of this study is to assess the correlation between oral hygiene habits and nutritional habits in patients with halitosis.

Material and Methods: 50 subjects with a complaint of halitosis and 50 subjects with normal otorhinolaryngologic examination completed the study. A self administered questionnaire was used to assess the prevalence of oral hygiene habits including teeth brushing, tooth brush changing period, flossing, tongue cleaning, use of mouthwash, and smoking habits. To assess the nutritional habits of the subjects, food consumption frequency questionnaire was used.

Results: The patients with halitosis were brushing their teeth, changing their tooth brush, using a dental floss, cleaning their tongue and using mouthwash more rarely than control group. 82% of halitosis group and 52% of control group were smokers. The difference was statistically significant. The halitosis group consumed milk and milk products, meat and meat products, tea and fizzdrinks, pickles, spices, ketchup more frequently.

Discussion: Oral hygiene habits and nutritional habits may have a role on occurrence of bad breath. So we are of the opinion that the improvement of oral hygiene habits and elimination of the risky nourishments may be the first step of the treatment period.

Keywords

Halitosis; Oral Hygiene Habits; Nutritional Habits

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Introduction

Halitosis is the general term used to describe any unpleasant odour in expired air. Other names used for this condition are fetor oris, bad breath, breath malodour, and oral malodour[1].

There are several causes of bad breath. This embarrassing odour may originate from oral or non-oral sources. Non-oral sources of breath odour are generally related to systemic problems such as diabetes, liver and kidney disorders, and pulmonary disease and/or medications those that reduce salivary flow such as antidepressants, antipsychotics, narcotics, decongestants, antihistamines, and antihypertensive drugs [2-4].

Non-oral conditions and medications can contribute to bad breath, but the main source of most halitosis is the oral cavity. Volatile sulphur compounds (VSCs) are predominate organic components which lead to halitosis. These VSCs are produced by the bacterial putrefaction by gram-negative anaerobic bacteria, particularly those residing on the posterior dorsum of the tongue, utilize sulphur containing amino acids, primarily cysteine and methionine. Other organic components such as organic acids, indole/skatole, putrescine, cadaverine may also be involved in the production of halitosis[4,5].

Oral conditions such as tooth decay, gingivitis, periodontal disease, aphthous stomatitis, and poor oral hygiene have been shown to contribute to bad breath[2,3,6].

Previously, nutritional habits have not drawn attention that may contribute to bad breath. As there is few data about the oral hygiene habits of patients with a complaint of halitosis, this study aimed to assess the oral hygiene habits of these patients. Additionally, we also aimed to find out any correlation between the nutritional habits and halitosis.

Material and Methods

Study design

This questionnaire based study is conducted at Mustafa Kemal University between January 2014 and June 2014. Ethics committee approval was obtained and was conducted adhering to the Declaration of Helsinki. Informed consent was obtained from all participants.

Study population and Progress of the study

The patients who referred to otorhinolaryngology department with a complaint of halitosis; between ages of 20-60 years; and able to complete the study were evaluated with a detailed history and otorhinolaryngologic examination. The exclusion criteria were: any oral, dental or periodontal condition; previous any systemic disease; use of any medication leading to bad breath. Patients with idiopathic halitosis were included in the study. The control group were healthy subjects who have normal otorhinolaryngologic examination.

Assessment of oral hygiene habits and nutritional habits

A self administered questionnaire was used to assess the prevalence of oral hygiene habits including teeth brushing, tooth brush changing period, flossing, tongue cleaning, use of mouthwash, and smoking habits. To assess the nutritional habits of the subjects, food consumption frequency questionnaire was used. Food consumption frequency questionnaire is the most common criteria of nutritional evaluation in epidemiological studies and has a standard form translated to Turkish[7]. In this questionnaire, nourishments were evaluated in 9 main groups:

- 1- Milk and milk products(full fat milk, half fat milk, full fat yoghurt, half fat yoghurt, full fat cheese, half fat cheese, skimmed cheese, butter milk)
- 2- Meat and meat products(fatty beef, lean beef, fatty mutton, lean mutton, chicken, turkey, fish, meat products, sweetbread)
- 3-Egg(whole egg, egg yolks, egg white, quail eggs)
- 4-Legume and oily pits(legume, walnut, hazelnut, peanut, pistachio nut, seed)

5-Bread and other grains(white bread, brown bread, white flat bread, brown flat bread, whole wheat bread, rye bread, macaroni, rice, cracked wheat, pastry, biscuits, cake)

6-Vegetables and fruits(green vegetables, yellow vegetables, potato, tomato, other vegetables, citrus fruits, summer fruits, dried fruits)

7-Oil(olive oil, canola oil, hazelnut oil, vegetable oil, margarine, butter, tail fat)

8-Sugar and desserts(sugar, desserts, honey, jam, sesame paste, molasses, chocolate)

9-Other(olive, tea, turkish coffee, instant coffee, alcohol beverages, fruit juices, fizzdrinks, turnip, pickles, spices, ketchup, mayonnaise)

The subjects were asked how often they consumed these 9 main groups and subgroups of nourishments. The options were every meal, every day in two meals, every day in one meal, once a week, twice or three days a week, 4 days a week, five or six days a week, three days or twice a month, once a month and never.

Statistical Methods

The SPSS statistical software package (SPSS, version 19.0 for Windows; SPSS Inc, Chicago, IL) was used to perform all statistical calculations. Adequacy of all parameters to normal distribution was tested by using Kolmogorov-Smirnov test. Parametric tests were applied to values with normal distribution; nonparametric tests were used in those without normal distribution. Chi-square test was used to compare the categorical parameters between the groups. Independent-samples t test was used for statistical comparison of data that match with normal distribution, and Mann-Whitney U test was applied to compare data without normal distribution between the groups. Differences were considered statistically significant at $p \leq 0.05$.

Results

A hundred subjects (45 men and 55 women) with a mean age of 39.31 ± 10.25 (age range 20 -60 years) completed the study. The study group consisted of 50 subjects with a complaint of halitosis whereas the control group consisted of 50 subjects with normal otorhinolaryngologic examination. Demographic properties and personal variables of the groups are summarized in Table 1. The groups were similar in terms of age, sex and BMI (respectively $p=0.467$, $p=0.843$, $p=0.904$).

Teeth brush habits and tooth brush changing period of halitosis group and control group are summarized in Table 2 and 3. The subjects in halitosis group were brushing their teeth more rarely than control group ($p=0.006$). The results of tooth brush changing period were significantly different for the groups; the subjects in halitosis group were

Table 1. Demographic properties and personal variables of the groups

	Halitosis group (n=50)	Control group (n=50)	p
Age (years)	40.06 ± 9.87	38.56 ± 10.67	0.467
Sex (female/male)	28/22	27/23	0.843
BMI (kg/m ²)	23.54 ± 1.90	23.58 ± 1.35	0.904

Table 2. Teeth brush habits of halitosis group and control group

	Halitosis group (n=50)	Control group (n=50)
Brushing their teeth three times a day	8 (16%)	11 (22%)
Brushing their teeth twice a day	12 (24%)	17 (34%)
Brushing their teeth once a day	7 (14%)	14 (28%)
Brushing their teeth every other day	8 (16%)	4 (8%)
Brushing their teeth once or twice a week	8 (16%)	2 (4%)
Brushing their teeth once in fifteen days	7 (14%)	2 (4%)

changing their tooth brush more rarely than control group ($p=0.004$). Only 18% of subjects in halitosis group use a dental floss whereas it was 48% for control group. 4% subjects in halitosis group claimed to clean their tongue whereas it was 20% for control group. 20% of sub-

Table 3. Tooth brush changing period of halitosis group and control group

	Halitosis group (n=50)	Control group (n=50)
Changing tooth brush in 3 months	6 (12%)	10 (20%)
Changing tooth brush in 6 months	16 (32%)	28 (56%)
Changing tooth brush after 6 months	28 (56%)	12 (24%)

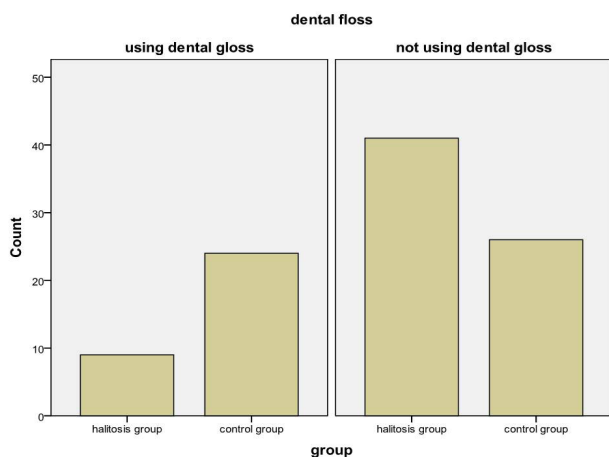


Figure 1. Dental floss use habits of halitosis group and control group

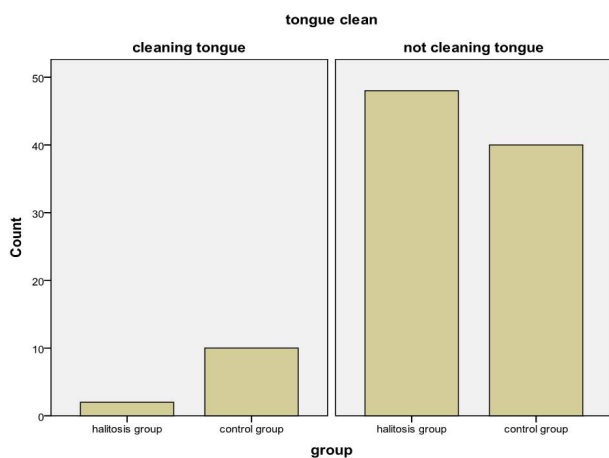


Figure 2. Tongue cleaning habits of halitosis group and control group

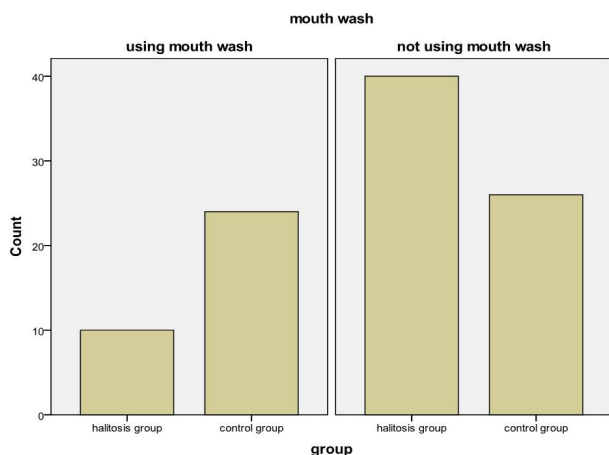


Figure 3. Mouthwash use habits of halitosis group and control group

jects use a mouthwash in halitosis group whereas it was 48% in control group. The difference was statistically significant in terms of using a dental floss, cleaning their tongue and using mouthwash ($p=0.01$, $p=0.14$, $p=0.03$) (Figure 1,2,3).

82% of subjects in halitosis group smoke whereas it was 52% for control group. The difference was statistically significant ($p=0.001$) (Figure 4).

The analysis of correlation of nutritional habits and halitosis revealed no statistically significant difference for egg, legume, hazelnut, peanut, pistachio nut, seed, walnut, bread and other grains, vegetables and fruits, oil, sugar and desserts, olive, turkish coffee, instant coffee, alcohol beverages, fruit juices, turnip ($p \geq 0.05$). On the other hand, the halitosis group consumed milk and milk products ($p=0.013$), meat and meat products ($p=0.010$), tea ($p=0.0001$) and fizzdrinks ($p=0.0001$), pickles ($p=0.001$), spices ($p=0.001$), ketchup ($p=0.034$) more frequently.

Discussion

Halitosis is not only a medical problem but also a social handicap for an individual. A recent study of United States dentists reported that chronic bad breath was diagnosed by 41% of dentists in one week [8]. Halitosis is a common condition and finding out the actual cause of bad breath is difficult.

The unpleasant odour originates from the oral cavity in 85% of patients with halitosis [9]. Oral malodour may be the result of lack of oral hygiene, including brushing, use of mouthwashes and flossing and lifestyle habits, such as smoking or the consumption of some food and drinks [10,11]. In a study including dental students, they suggested that students who brush their teeth at least twice daily, changed their brush within 3 months, cleaned their tongue regularly and used a mouthwash had lesser prevalence of halitosis as compared to the ones who did not follow such oral hygiene practices. The results of other studies were in agreement with the results of this study [12,13].

Consistent with the literature, in our study, patients with halitosis were brushing their teeth, changing their tooth brush, using a dental floss, cleaning their tongue and using mouthwash more rarely than control group.

Smoking has been defined as an oral source of halitosis [13]. Tobacco smoke contains VSCs, which are responsible for the oral malodour of people who smoke but also predisposes to hyposalivation and periodontal diseases [2]. In our study, 82% of halitosis group and 52% of control group were smokers. The difference was statistically significant.

Consumption of odiferous food and drinks such as garlic, onion, durian or spices, cabbage, cauliflower and radish has been reported to be a cause of oral malodour in previous studies [10]. Studies about the role of tea and coffee in oral malodour reported an association between drinking tea or coffee and reduction in certain oral microorganisms

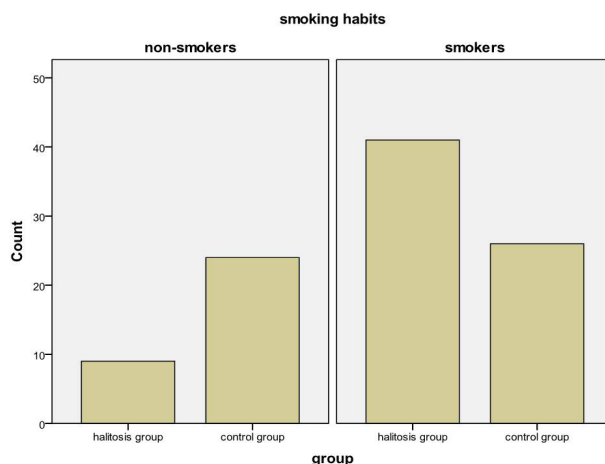


Figure 4. Smoking habits of halitosis and control group

[14]. Also, alcohol intake may predict oral malodour[15]. In our study, the halitosis group consumed milk and milk products, meat and meat products, tea and fizzy drinks, pickles, spices, ketchup more frequently. The elimination of these foods and drinks may be the first step of prevention from halitosis.

The limitations of our study is the small sample size we studied. We believe that studies with larger number of subjects and more detailed studies will be further beneficial.

Conclusion

It can be concluded from our study that oral hygiene habits and nutritional habits may have a role on occurrence of bad breath. So we are of the opinion that the improvement of oral hygiene habits and elimination of the risky nourishments may be the first step of the treatment period.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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