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## Review Article

# Diagnostic pitfalls of tobacco smoking: The effect of nicotine addiction on the oral cavity – Literature review



Marcela Koc-Gąska\*,<sup>1</sup>

Periodontology Outpatient Clinic, Provincial Specialist Dental Outpatient Clinic in Olsztyn, Poland

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### ABSTRACT

**Introduction:** Tobacco smoking is acknowledged to be the most dangerous risk factor for many diseases. Tobacco enters the organism through the oral cavity. Here, both local and systemic effects of smoking are visible. One of many clinical symptoms caused by smoking is “diagnostic masking.” The World Health Organization has recognized nicotine addiction as a chronic and recurring disease which requires a comprehensive therapy. A dentist can be the first person who begins such a therapy.

**Aim:** To present the effect of smoking on the condition of the oral cavity with reference to its masking influence and to promote an anti-nicotine attitude.

**Material and methods:** This article is based on a review of the medical literature.

**Results and discussion:** Making patients aware of the negative effects of nicotine on one's organism is more difficult if they do not notice or experience negative symptoms of smoking. **Conclusions:** The hazards associated with tobacco smoking have been known for a long time and confirmed with research results. The so-called “masking symptoms” should not escape a physician's attention. A lack of reddening, swelling and bleeding of the gums during probing in smoking patients does not prove that they do not suffer from a periodontal disease. The presence of lesions typical of smoking in the oral cavity does not mean they should not be differentiated from diseases which pose threat to life and health. Thus it is indispensable to perform additional diagnostic procedures to avoid hypodiagnosis. Numerous unfavorable consequences of cigarette smoking which occur in the oral cavity and elsewhere should be presented as warnings and posted on tobacco products' packaging.

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\*Correspondence to: Żołnierska 12 C/31, 10-559 Olsztyn, 36-050 Sokołów Małopolski ul. Lubelska, 43, Poland. Tel.: +48 880 195 626.

E-mail address: [marcelakoc@wp.pl](mailto:marcelakoc@wp.pl)

<sup>1</sup>Dentist, during specialization in Periodontology. Specialization carried out at: Periodontology Outpatient Clinic, Provincial Specialist Stomatological Outpatient Clinic in Olsztyn, Żołnierska 18, 10-561 Olsztyn, Poland.

## 1. Introduction

Nicotine addiction affects many people in Poland. According to the World Health Organization (WHO) report of 2010, tobacco smokers constitute 28% of the Polish population (on the basis of the research conducted in 2008).<sup>12</sup> A comparative analysis of the WHO data collected over more than 10 years indicates that the percentage of men smoking cigarettes has slowly decreased, yet the percentage of smoking women has remained stable since 1999.<sup>12,13,14</sup> Data found in literature concerning the subject show that one in five deaths results from tobacco-induced diseases.<sup>4</sup>

Smoking tobacco products has been considered a risk factor for the development of numerous diseases and a modifying factor in their course. This is due to the fact that tobacco smoke contains harmful substances which have antigenic, cytotoxic, carcinogenic and mutagenic effects on the human organism. As research has shown, cigarette smoke contains 4000 potentially toxic substances, whilst nicotine is the most recognizable component of tobacco.<sup>6,15</sup>

Numerous oral cavity diseases are connected to nicotine addiction. Lesions caused by tobacco can be divided into systemic and local, with the latter resulting from a direct impact on the oral cavity. Some symptoms are very typical of smokers and are not life-threatening. However, the similarity of some lesions caused by tobacco smoking to other dangerous diseases has to be taken into consideration in the diagnostic process.

## 2. Aim

The main aim of this article is to present the effect of tobacco smoking on the condition of the oral cavity and to point attention to differences between symptoms in smoking and non-smoking patients, and as a consequence to encourage physicians to introduce a minimal anti-nicotine intervention in their practice.

## 3. Material and methods

This article is a review of the medical literature, health reports and media reports.

## 4. Results

Data from the WHO report indicate that the prevalence of smoking among people over 15 years of age in Poland has slightly changed over the last decade or so. A greater decrease in the number of smokers has been observed in men – between 1994 and 2001 it amounted to 2.0%, and between 2005 and 2010 the percentage of smoking men dropped from 37.6% to 33.2%. Among women, no such decrease has been observed. Data for the 1994–1998 period show that 24.0% of women smoked, and in 2001, 2007 and 2010 this number did not change and amounted to 23.0%.<sup>12,13,14</sup> Generalizing, it can be assumed that in 2010 one-third of Poles smoked cigarettes. This indicates that every third person who visits a medical office is a smoker and can exhibit

problems associated with this addiction. Table 1 presents the percentage of women and men smoking cigarettes in Poland over the last dozen years or so.

The effects of tobacco smoking on the oral cavity can be considered with regard to local as well as systemic aspects. The local impact of tobacco smoke is evident in the form of the following pathologies:

- hygienic negligence,
- discolored teeth and dentures,
- halitosis, unpleasant body odor,
- increased caries, as an indirect effect of smoking cigarettes,
- changes in microbiota,
- pigmentation changes involving the oral mucosa,
- disorders of oral keratosis,
- xerostomia,
- fungal infection,
- black hairy tongue,
- neoplasms of the oral mucosa.

Neglecting the hygiene of the oral cavity is more often found in smokers than in non-smokers. Numerous studies confirm these findings.<sup>2,6</sup> According to some authors, such neglect results from devoting an insufficient amount of time to hygienic activities.<sup>2</sup> Still other authors emphasize that a less hygienic condition of the oral cavity in smokers is fostered by an increased mineralization of the plaque, which in turn facilitates the development of both supragingival and subgingival calculus deposits.<sup>6</sup> The nicotine deposit penetrates into the enamel and dentine as well as fillings and dentures, causing unsightly black and dark brown stains on these structures. Additionally, an unpleasant odor emanating from the mouth can be detected, which also results from smoking. Halitosis occurs because tobacco smoke includes many odorous gases which permeate the smoker's body and clothes. The smoker is very often not conscious of these drawbacks concerning their addiction. Masking the unpleasant smell is not a good solution to this problem, since breath refreshing products contain sugars and citric acid, which foster the development of caries. In consequence, caries becomes another indirect effect of smoking cigarettes.<sup>6</sup> Changes in the oral microbiota which are caused by smoking have been the subject of many studies. Most recent reports indicate that the effect of smoke coupled with the influence of bacteria has harmful outcomes.<sup>2</sup>

**Table 1 – Percentage of male and female smokers in Poland.**

Years	Sex	
	Female (%)	Male (%)
1994–1998	24.0	44.0
1999–2001	23.0	42.0
2007–2005	23.3	37.6
2010–2008	23.2	33.2

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