SUMMARY

Introduction: Oral diseases are major health problems for society. Demographic, health, personal and clinical factors influence the DMFT index of patients. There is a connection between oral hygiene habits, smoking, amount of food, frequency of intake and the spread of oral diseases. The lack of attention for oral care leads to the appearance of oral lesions.

Purpose: The main aim of this study is to determine the factors for oral pathology and to find if there is a correlation between oral status of the patients, their dental habits and attitude to oral health.

Participants and methods: Subject of this social study are 603 patients, 380 women (63%) and 223 (37%) men, range age 18 – 82 years. All of them are from North-Eastern Bulgarian regions – Varna, Dobrich, Shumen and Targovishte. Every patient has been asked to answer 20 questions and has undergone a clinical examination. DMFT index was recorded.

Results: We found oral mucosal lesions as leukoplakia, lichen planus, Candidal infections, fissured tongue, lingual varicosities and mucocele in 11.44% of patients. Dental caries was found to be prevalent in almost all examined patients. DMFT index varied from 5.01±3.6 to 16.45±4.9 in different age groups. Data about tooth brushing and using of additional methods for controlling the biofilm was also presented. The results showed that younger patients have better oral and dental health and pay more attention on maintaining their oral hygiene.

Conclusions: The oral and dental status of the Bulgarian patients can be assessed as average damaged with high treatment needs. To make it better a lot of health promotional and dental preventive activities are needed especially in the field of improving hygiene habits, use of additional funds for hygiene and more frequent dental visits of the whole population.

Keywords: oral status, dental status, Bulgarian patients, DMFT index, oral mucosal lesions, oral hygiene

INTRODUCTION

Oral diseases are the most common chronic diseases [1]. They are a major health problem for society. They are not fatal, but they affect ability to eat, speak and socialise. Thus, they affect negatively people’s general health, lifestyle and psychosocial well-being.

Oral diseases are major health problems for society. Demographic, health, personal and clinical factors influence the DMFT index of patients. There is a connection between oral hygiene habits, smoking, amount of food, frequency of intake and the spread of oral diseases. The lack of attention for oral care leads to the appearance of oral lesions.

The most common oral infection disease is tooth decay. This disease can affect anyone. Many factors affect the caries process. That includes the form of food or fluids, duration of exposure, the amount of salivary flow and oral hygiene [2]. Many studies confirmed the connection between intake of cariogenic food and oral health. Since the introduction of fluoride, the frequency of caries worldwide has decreased [3,4].

Little attention is given to oral diseases, although they are a great burden for individuals [5]. The lack of attention for oral care leads to the appearance of oral lesions. The awareness and proper diagnosis of common oral lesions will facilitate their management. Appropriate diagnosis and treatment of oral lesions is important not only for oral and to general health too.

The main aim of this social study is to determine the factors for the oral pathology and to find if there is a correlation between oral status of the patients, their dental habits and attitude to oral health.

MATERIALS AND METHODS

A cross-sectional survey was conducted among 603 patients, 63% female and 37% men. Subjects are a sample of patients seeking for dental examination - from 2012 to 2017. All of them are from North-Eastern Bulgarian regions – Varna, Dobrich, Shumen and Targovishte. The age range of the patients was between 18 and 82 years.

The survey consisted of clinical examination and questionnaire-based interview. All patients enrolled in the study were physically and mentally capable of responding the questionnaire. The study consisted of 20 questions for assessment of oral health status. The issues of survey refer to frequency of dental check-ups, using of additional methods of controlling biofilm, presence or absence of pain/missing teeth/prosthesis, taking fluoride supplements, eating sweets, drinking soda and alcohol, smoking habits. Data from self-assessment questionnaires were analysed using SPSS software, version 19. The p-value pd”0.05 was considered significant.

After completing the questionnaires, a standardized extraoral and intraoral examination was performed. We used flat mouth mirrors, straight and curved probes, tweezers to measure the DMFT index. The dental examination included recording the detailed condition of teeth, distribution of natural teeth and prosthesis, evidence of oral mucosal lesions.
RESULTS
The study started in 2012. For a period of 5 years we examined 603 patients with a predominance of the female gender. All participants were from North-Eastern Bulgaria. The sex distribution was 380 women (63%) to 223 (37%) men. The data is shown in figure 1.

**Fig 1. Gender prevalence**

All of the participants were divided into 4 groups according to the age range:
- A (18-29 years old)
- B (30-49 years old)
- C (50-64 years old)
- D (65 years and over)

The distribution of all patients according to the age groups was as follows: subjects in group A were 97 (16%), in group B – 347 (57.7%), in group C – 109 (18%) and in group D - 48 (8%). (Fig. 2).

**Fig 2. Age diversity by groups**

The results of the questionnaire about hygiene habits can be presented in this way:
- 84 subjects (86.6%) of group A have used additional methods of controlling the biofilm and 13 (13.4%) have used the only toothbrush and paste or nothing;
- 212 subjects (61.1%) from group B reported for using additional methods;
- 20 (18.3%) from group C have used different methods and 89 (81.7%) have used the only toothbrush and paste or nothing.

- Only 2 subjects (4.2%) from group D reported for using additional methods (Fig. 3).

The majority of younger patients use additional methods for their daily oral hygiene. With aging this trend decreases. The data is shown on fig. 3:

**Fig. 3. Using different methods of controlling the biofilm**

Smoking has a very big impact on oral health. It increases the risk for periodontal changes, tooth loss, bone loss, impaired wound healing and effect on oral health [6]. According to our survey non-smokers were insignificantly more than smokers (50.27% vs 49.73%). The majority of smokers were males.

Data is shown on fig. 4.

**Fig. 4. Non-smokers vs smokers – females and males**

Oral examination started with detection of oral mucosal lesions and we found such in 69 patients (11.44%). For precise diagnosis, we have to determine the size, location, surface morphology, colour, pain and duration. We found in our study oral mucosal lesions in patients between 29 and 67 years old.

Mucosal damages included leukoplakia (6), lichen planus (10), Candidal infections (16), fissured tongue (15), lingual varicosities (21) and mucocele (1) (Tab. 1). The overall prevalence of oral mucosal lesions in men were not significantly different than that in women. Some of our cases are shown in Figure 5, 6 and 7.
Table 1. Oral mucosal lesions.

<table>
<thead>
<tr>
<th>Oral mucosal lesions</th>
<th>Number of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leukoplakia</td>
<td>6</td>
<td>0.96%</td>
</tr>
<tr>
<td>Lichen planus</td>
<td>10</td>
<td>1.66%</td>
</tr>
<tr>
<td>Candidal infection</td>
<td>23</td>
<td>3.81%</td>
</tr>
<tr>
<td>Fissured tongue</td>
<td>15</td>
<td>2.49%</td>
</tr>
<tr>
<td>Lingual varices</td>
<td>21</td>
<td>3.48%</td>
</tr>
<tr>
<td>Mucocele</td>
<td>1</td>
<td>0.17%</td>
</tr>
</tbody>
</table>

Fig. 5. 52-years old woman with Leukoplakia.

Fig. 6. 49-years old men with Candidal infection.

The mean value of DMFT index varied from 5.01 ± 3.6 to 16.45 ± 4.9 in different age groups. No difference was found between sexes in the mean DMFT (Tab. 2). Index is significantly lower in first age group – from 18 to 29 years old, while in group C and D its’ values are very high (12.87 and 16.45). Mean decayed teeth (DT), missing teeth (MT) and filled teeth (FT) of study subjects were significantly greater in elderly patients, which was related to the neglect of oral hygiene.

Table 2. DMFT index in different age groups.

<table>
<thead>
<tr>
<th>Age groups</th>
<th>DMFT index</th>
<th>SD +/-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group A (18-29 years old)</td>
<td>5.01</td>
<td>± 3.6</td>
</tr>
<tr>
<td>Group B (30-49 years old)</td>
<td>9.52</td>
<td>± 4.4</td>
</tr>
<tr>
<td>Group C (50-64 years old)</td>
<td>12.87</td>
<td>± 5.1</td>
</tr>
<tr>
<td>Group D (65 years and over)</td>
<td>16.45</td>
<td>± 4.9</td>
</tr>
</tbody>
</table>

This social study proved the strong correlation between DMFT index as a criterion for oral health and use of additional methods of controlling the biofilm in different groups (Fig. 8).

Fig. 7. 63-years old woman with Mucocele.

Fig. 8. Correlation of caries and additional methods of controlling the biofilm.

Fig. 9. 49-years old men with Candidal infection.
DISCUSSION

The study focuses on the impact of oral hygiene on oral health. The sample cannot be representative of the completely Bulgarian population, but we could extract enough information about the oral and dental status of the community. In order to identify the need for preventive treatment, it is necessary to address dental problems. Our study would help to highlight oral health problems among different groups of population.

Many studies prove the connection between oral hygiene habits and the spread of oral pathology and diseases [1,6,7]. Patients’ daily hygiene habits determine the potential risk of harm to their oral health.

This survey evaluates general oral health and prevalence of oral mucosal lesions and dental status in first-visit attendees. According to our study, toothbrush and toothpaste was the oral hygiene tool, which is used by the greater percentage of patients. Many factors such as income and social status, education, physical environment, genetics, health services influence health problems [8].

Responders showed that gender was not determinative for the use of additional methods of controlling the biofilm. Persons from older age categories (50 and greater) stated that they don’t use additional methods for their daily oral hygiene. With increasing the age, the use of additional methods is going down. We even examined five patients who told that do not brush their teeth.

Besides the need to evaluate dental caries and periodontal diseases, the discovery of oral mucosal lesions and oral carcinoma is very important [9]. In the last years, health care providers have become more aware of oral mucosal lesions and their importance [10]. Sometimes wide variations of oral pathology can make diagnostic difficulties to general dentists. In our study, oral mucosal lesions were found in 11.44% among the whole examined population. 67% from lesions were tobacco-related. Males (6.63%) appeared to have more lesions than females (4.81%), which correspond to other studies [10-14].

Our study shown that lingual varicosities, Candidal infection and fissured tongue were the most common oral lesions. Majority of our patients had Candidal infection (3.81%). Usually oral candidiasis is caused by normally harmless microorganisms. To detect candida presence a special microbiological investigation should be made. From all 23 cases, 19 of them were with very poor oral hygiene and 8 of them were smokers. Most of Candidal cases were elderly patients - 15 of them had dentures. Four of cases with candida were females at fifth decade, who reported to have xerostomia. Only two subjects were young - 22 years male and 20 years female. Improving of oral hygiene and anti-fungal agents were prescribed.

Our data showed 3.48% prevalence of lingual varicosities and it was the second most seen oral lesion. This condition is related to aging. It was noted in subjects after 45 years of age. This benign condition showed no gender predisposition. Fissured tongue was seen in 2.49% of all investigated subjects. It is anomaly of the tongue dorsum, which may lead to inflammation or secondary fungal infection and halitosis. We recommended to our patients brushing of the tongue dorsum and mouthwashes.

Lichen planus was found in 10 out of 603 patients. This is relatively common oral disease of skin and mucous membranes. From all cases 8 were located on buccal mucosa. Other 2 on gingiva. Nine of subjects were with white, lacy patches. One patient was with swollen tissues, redness and burning sensation. Regular follow-up is very important, because oral lichen planus may go to malignant transformation [15].

Leukoplakia is a form of oral precancer. We found this lesion in 0.96% of all subjects. It is lesion that cannot be rubbed off. Five from six of patients with leukoplakia were smokers, at the age of 35 and more. Smoking is the second greatest risk factor for global death and disability. His impact on the oral cavity has been identified - from aesthetic changes to fatal diseases such as oral cancer [6].

Almost half of the patients in the study (49.75%) were smokers – 18.90% were women, and 30.85% were men. In our survey all smokers were with poorer oral health, compared with non-smokers. The higher number of lesion prevalence in men could be related to the higher number of tobacco users among them [16].

Risk of oral mucosal lesions increases with age, use of tobacco, and alcohol consumption. Several measures should be taken – early detection, smoking cessation and adequate treatment. Dentists play a key role in giving information about cessation of smoking.

We have one case of mucocele. It was a 63 years old female patient. Mucocele is a salivary gland disorder. The lesion was on lower lip in 42, 43 region. On examination it has a soft consistency, fluctuant, with oval shape and no increase of temperature. Color of swelling was the same as mucosa. The diagnose was made on clinical features and a history of mouth bite. The appearance of lesion was pathognomonic. The patient had no difficulty in speaking or chewing.

Dental caries is a polymicrobial disease, which is caused by bacterial commensal species who are present in lower levels in healthy people. According to survey in Ninth People’s Hospital of Shanghai Jiao Tong University, treatment of dental caries should be aimed at balancing restoration and modulating interactions to oral microbiota [17]. Dental caries is major health problem in most countries. Similar to data of other studies, our survey demonstrated that patients with poorer oral hygiene have increased number of decayed, missing and filled teeth [6,7,17].

Almost all the examined patients in our study was affected by dental caries. The DMFT index increased rapidly with age – from 5.01 in the age group 18-29 years old to 16, 45 in the age group 65 years and over. Carious activity was higher as in all developed countries, correlating with the consumption of more refined sugar and necessity of more fluorides [18]. The carious lesions and the DMFT index were statistically significantly associated with variables such as age, frequency of dental cleaning and use of additional methods, visits at the dentist office. The most required treatment was extraction (1.98 ± 4.03). The proportion of edentulous adults aged 65 years or more was still high.
CONCLUSIONS

We made this study in order to determine the causal factors for the oral and dental pathology of the Bulgarian patients and to contribute to the improvement of patients’ status.

We found that the risk of oral and dental pathology in our patients involves a number of factors: behavioural and life-related factors such as poor oral hygiene, inappropriate or missing additional methods of controlling the biofilm, lack of fluorides, social and some physical factors. Bulgarian patients have average damaged oral and dental status with high treatment needs. Many health promotional and dental preventive activities are needed to make it better. They should be in in the field of improving hygiene habits, use of additional funds for hygiene, more frequent dental visits.

The diversity of oral diseases changes with age and increases with general morbidity. Routine examinations of oral cavity should be mandatory in order to detect oral mucosal lesions.

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1895