Assessment of periodontal status and oral hygiene habits in a group of adults with type I diabetes mellitus

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Summary

Diabetes mellitus is identified as risk factor for periodontal disease. Personal and professional plaque control is the most important factor for prevention and treatment of periodontal disease. The aim of this study is to evaluate the importance of awareness of oral hygiene habits by filling in a questionnaire, in contrast with the assessment of periodontal status by recording of Community Periodontal Index (CPI) in a group of 50 adults with type I diabetes mellitus (formerly known as insulin-dependent). The results reveal deficiencies in oral health behavior (no one uses instruments for interdental cleaning) and high scores of CPI (code 0 = 0%, code 1 = 0%, code 2 = 24%, code 3 = 44%, code 4 = 32%). The majority of subjects (80%) did not receive information about dental care and oral diseases and no one received information about the influence of gum disease and diabetes. This study proves the need of promoting oral health in this risk group.

Key words: diabetes mellitus, oral hygiene, periodontal status.

Introduction

The evolution of society is associated with increased life expectancy and pathologies such as diabetes. According to WHO data, in 2000, 176,525,312 people with diabetes mellitus have been registered worldwide and for 2030 the value is estimated to be 370,023,002. For Romania, 1,092,212 people with diabetes mellitus have been reported and for 2030 a figure of 1,807,974 is estimated.

Objective

The aim of this article is to evaluate the importance of awareness of oral hygiene habits by filling in a questionnaire, in contrast with the assessment of periodontal status by recording Community Periodontal Index (CPI) in a group of adults with type I diabetes mellitus.

Material and method

Subjects. A number of 50 patients with type I diabetes (insulin-dependent) have been exam-ined in the Diabetes Clinic of the Constanta Hospital. Partially edentulous subjects have been selected, in which Community Periodontal Index could be recorded [1] *(Figure 1).*

Figure 1. Recording CPI.

Oral examination. Periodontal condition was assessed using the Community Periodontal Index (CPI) (WHO 1997) [2]. The recordings were based on the code number observed after examination of all remaining teeth, excluding third molars, in each of the six segments (sex-

tants) containing at least two functional teeth from six sites of the tooth.

The subjects, sextants and teeth were classified according to the highest code number recorded (codes 0-4). CPI recordings were made using the following code numbers:

Code 0 = healthy periodontal tissue;

Code 1 = bleeding after probing;

Code 2 = supra- or subgingival calculus and/ or overhanging(s) of filling(s) or crown(s);

Code 3 = pathological pocket(s) of 4 or 5 mm;

Code 4 = pathological pocket(s) of 6 mm deep or more;

Code X = the index cannot be recorded.

Questionnaire. The questionnaire contains 10 items. Questions were closed and mostly multiple choice with alternative statements. The questions covered self-oral care, prevention of oral diseases, utilization of dental services and knowledge and attitude towards oral health.

1) In which year have you been diagnosed with diabetes?

2) When was your last dental appointment?

1. less than 1 year ago;

2. 1-2 years ago;

3. 3-5 years ago;

4. more than 5 years ago.

3) If you have not had dental treatment for two years, what is the reason?

1. dental care is unpleasant;

2. dental care is too expensive;

3. I have not had any problems with my teeth/dentures;

4. it is difficult to make an appointment because of my work;

4) How would you describe the condition of your mouth and teeth?

1. good;

2. quite good,;

3. average;

4. quite bad;

5. bad.

5) How much information have you received about dental care and oral diseases?

1. I have received sufficient information;

2. I have received some information but not enough;

3. I have not received information;

4. I do not know.

6) Have you received any information about the influence of gum disease and diabetes?

1. no

2. yes.

7) Do you think you have any gum disease at this moment?

1. I have gum disease now;

2. I do not have gum disease now, nor have I had gum disease earlier;

3. I had gum disease earlier this year;

4. I had gum disease more than one year ago;

5. I had gum disease two or more years ago;

6. I do not know.

8) How often do you brush your teeth?

1. almost every day;

2. once a day;

3. more often than once a day;

4. I do not brush my teeth.

9) What do you use for cleaning the space between the teeth?

1. dental floss;

2. toothpick;

3. interdental brush;

4. nothing.

10) Oral health is not as important as general health:

1. fully agree;

2. somewhat agree;

3. I do not know;

4. somewhat disagree;

5. fully disagree.

Results

The study group consists of 50 people with type I diabetes mellitus, 32 (64%) men and 18 (36%) women.

Medical data. All the subjects have a medical history of long-term insulin-dependent diabetes mellitus, ranging from 6 months to 20 years old.

Blood glucose level ranges from 212 mmol/l to 357 mmol/l.

Age. The age of subjects is between 40 and 70 years old *(Chart 1)*.

CPI score. The results of CPI recording are code 0 = 0%, code 1 = 0%, code 2 = 24%, code 3 = 44% and code 4 = 32% *(Chart 2)*. The CPI values are higher in men than women *(Chart 3)* and decreased due to extraction of teeth for periodontal causes *(Chart 4)*.

Oral hygiene habits

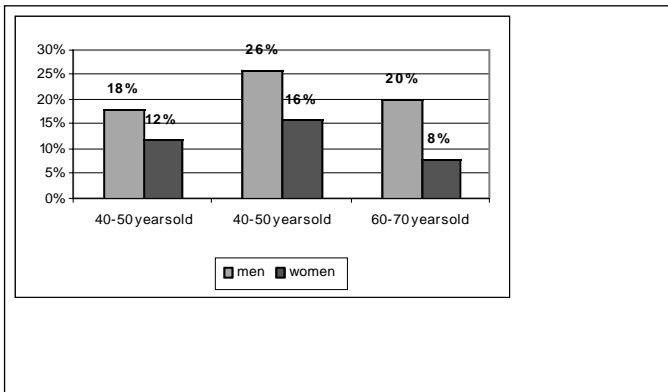Oral care has been investigated with the following questions:

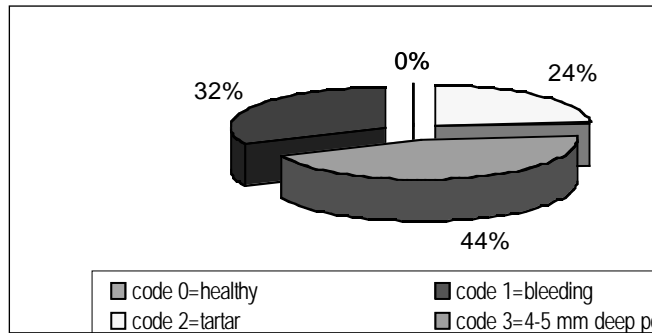**Chart 1. Distribution of group according to age and gender.**

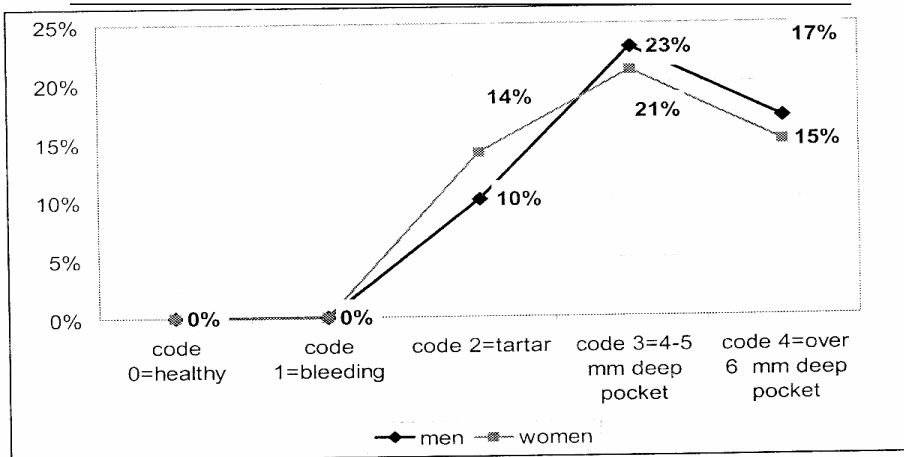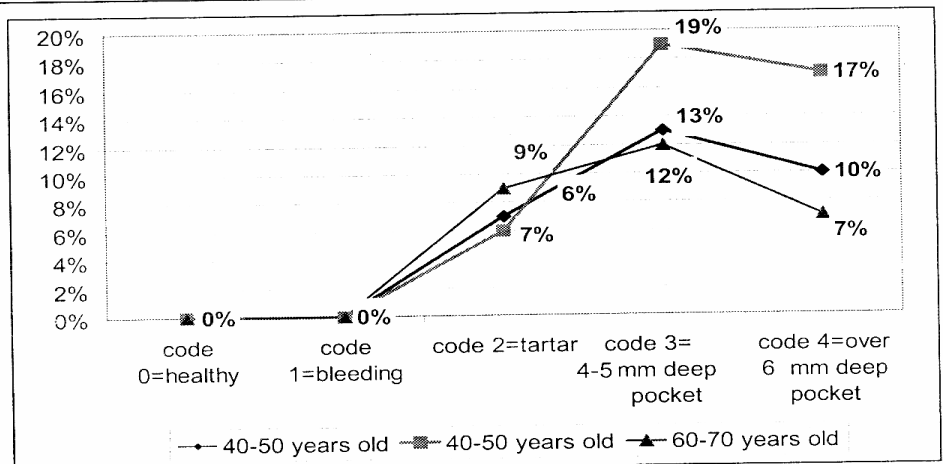**Chart 2. Values of CPI scores.**

Chart 3. Distribution of CPI scores according to gender.

Chart 4. Distribution of CPI scores according to age.

1. How often do you brush your teeth?

2. What do you use for cleaning the space between the teeth?

3. When was your last dental appointment?

4. If you have not had dental treatment for two years, what is the reason?

The frequency of tooth brushing is shown in *Chart 5*. Just 24% of subjects questioned brush their teeth more than once a day. The interest for oral care decreases with age, the higher rate of those who admitted that they do not brush their teeth, is among people of 60-70 years old.

At the question "What do you use for cleaning the space between the teeth?" all the patients have answered "nothing". They are not familiar with dental floss or interdental brushes.

At the question "When was your last den-
tal appointment?" just 10% of subjects declared that they had a dental appointment less than one year ago, 25% 1-2 years ago, 40% 3-5 years ago and 25% more than 5 years ago *(Chart 6)*. The patient reduced their dental visits with the advanced age and teeth loss.

The majority (98%) of subjects questioned recognized that the main reason for non-attending dental treatment was financial. The remaining 2% mentioned other reasons.

The awareness of oral health

Awareness of oral health has been investigated with the following questions:

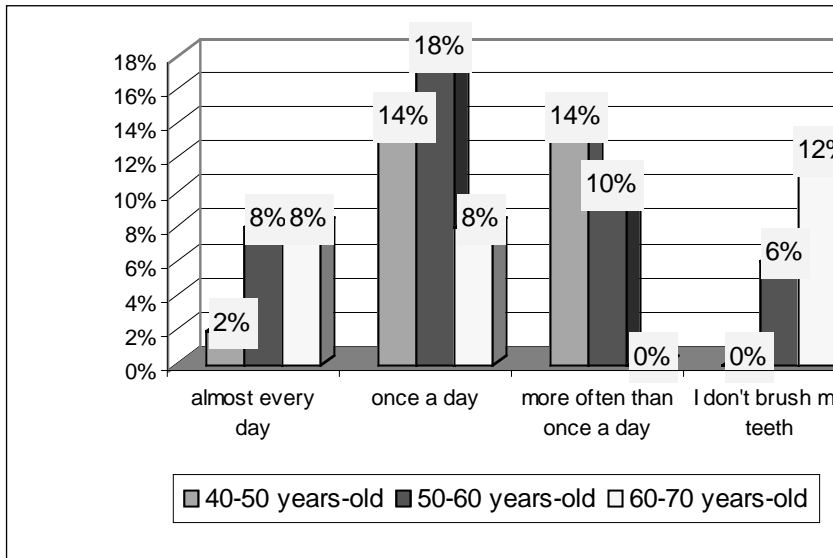1. How would you describe the condition of your mouth and teeth?

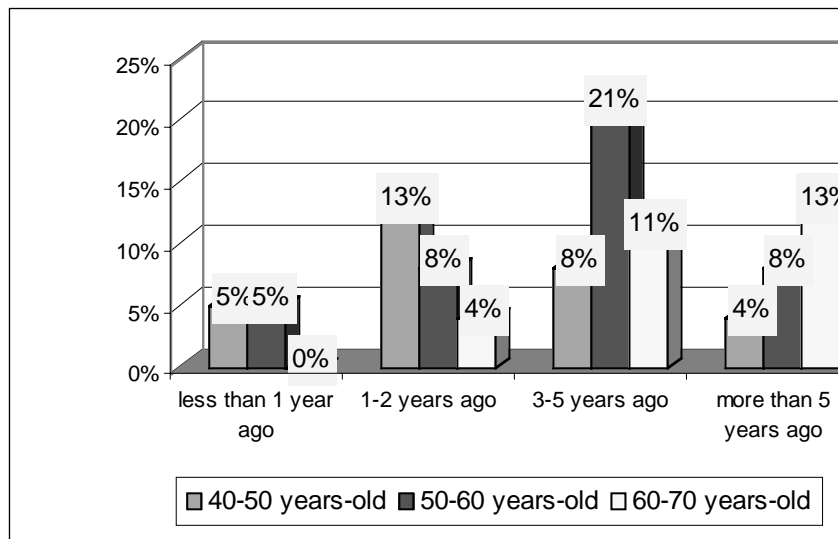
Chart 5. Frequency of tooth brushing.

Chart 6. The last dental appointment.

2. How much information have you received about dental care and oral diseases?

3. Have you received any information about the influence of gum disease and diabetes?

4. Do you think you have any gum disease at this moment?

5. Oral health is not as important as general health.

Most of the patients described their oral condition as quite bad (40%), and the other as good (20%), quite good (20%), average (10%) and bad (10%) *(Chart 7).*

The majority of the subjects (80%) did not receive information about dental care and oral diseases and 10% answered "I do not know" and no one received information about the influence of gum disease and diabetes.

The lack of information about dental care and oral diseases is revealed in the response at the question "Do you think you have any gum disease at this moment?", where subjects answered "no" (50%), "I do not know" (40%) and "yes" (10%) *(Chart 8).*

At the last statement "Oral health is not as important as general health", 55% fully agree with this declaration and just 10% fully disagree, 5% somewhat agree, 20% somewhat disagree and 10% answered "I do not know" *(Chart 9).*
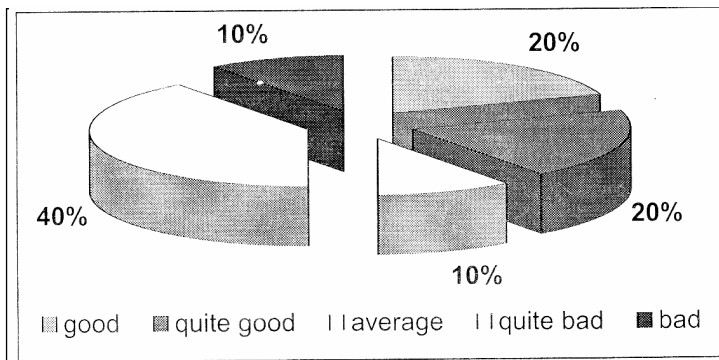

Chart 7. Answers to question: *How would you describe the condition of your mouth and teeth?*

Chart 8. Answers to question: *Do you think you have any gum disease at this moment?*
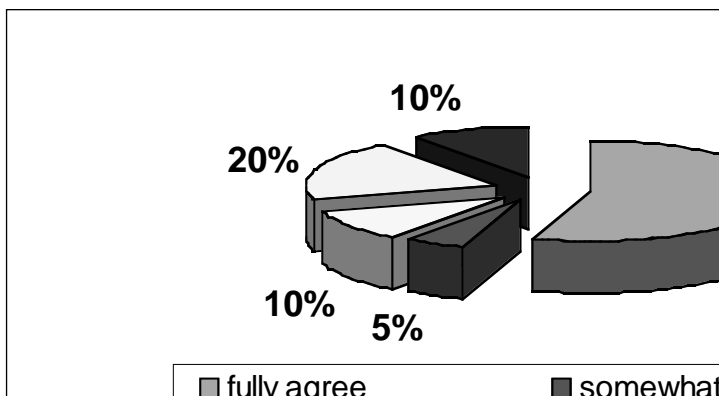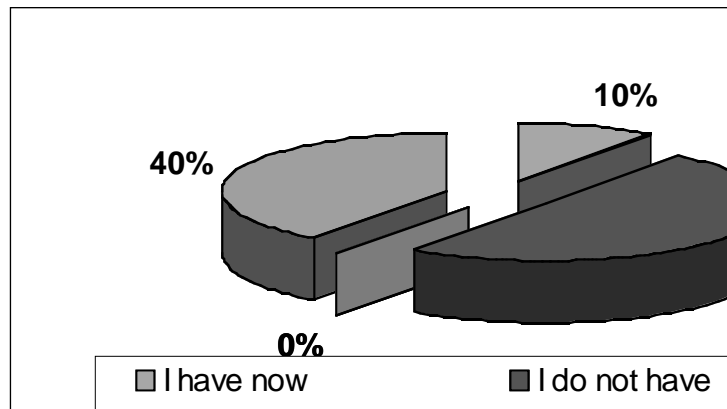

Chart 9. Answers to statement: *Oral health is not as important as general health.*

Discussion

Identified risk factors for periodontal disease include smoking, ageing, oral hygiene status and micro-organisms, history of periodontitis, family history, genetic factors and certain systemic diseases and conditions, such as diabetes, osteoporosis and HIV infection [3].

There is a considerable body of published literature exploring associations between the prevalence and severity of periodontal infections and cardiovascular diseases (especially myocardial infarction), cerebrovascular diseases (especially occlusive stroke) and birth complications (premature and underweight births). These oral and systemic diseases share common risk factors, such as poor diet, smoking, diabetes, and genetic predisposition [4].

Diabetes used to be thought of as a disease of rich countries, but in fact most people with diabetes live in either very poor or relatively poor circumstances. Thus, the majority of people with diabetes live in developing rather than developed countries, and the vast majority of the increase in diabetes prevalence in the next two decades will take place in developing countries. Within developed countries the prevalence of diabetes is higher in the less well off sections of the population.

Recent studies have suggested evidence for a bidirectional adverse interrelationship between diabetes mellitus and periodontal diseases [5, 6]. In particular, individuals susceptible to diabetes and those with poor metabolic control may experience one or more complications in multiple organs and tissues.

Despite the fact that periodontal diseases are multifactorial in nature, oral self-care plays a central role in disease prevention, treatment and maintenance care. While a variety of factors affect periodontal health, *Löe* [7] concluded that instruction and motivation of patients with regular visits to the dental office seem to be the most successful approaches in preventing periodontal relapse and disease progression.

Conclusion

A high prevalence of periodontal pockets (CPI 3 or 4) among the study population was found.

Oral self-care among adults with diabetes is inadequate; the results revealed deficiencies in oral health behaviours (just 24% of subjects brush their teeth more than once a day and no one uses instruments for interdental cleaning) and indicated a need for oral health promotion among adults with diabetes.

In addition to commonly identified determinants of oral health behaviours, the results indicated the importance of awareness and appreciation of oral health.

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