The establishment of the value of the oral health condition as a predictive index or as an assurance index of diabetes in dentistry

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Summary

Objectives. The significance of the maintenance and promotion of the oral health is accentuated in the case of diabetics. The main goal of our study is to establish the value of the oral health condition as a predictive or assurance index of diabetes in dentistry. Secondly, our studies followed the establishment of the significance that the patients diagnosticated with diabetes show it to the care of their own oral cavity.

Material and Method. We have divided a target experimental group made of 240 patients into 2 key subgroups: patients with a declared diabetes versus apparently healthy patients. For the patient's evaluation we elaborated an evaluation questionnaire of the oral health condition.

Result and Discussions. The periodontal disease (37%) has superior and surprisingly percentages in the case of the patients with declared diabetes. It can be considered an assurance index. Oral health condition can be a prediction index of diabetes. In order to study the oral self-care determinants we chose New Century model for the promotion of oral health. The results show that an improvement can also exist as for the oral self-care among diabetic patients.

Conclusions. Dentists must be more involved in the case of diabetics and collaborate faster and more actively with their generalist colleagues.

Keywords: oral health, diabetes, oral self-care.

Introduction

Despite the evidences that show a close connection between diabetes and the periodontal diseases, and the recent studies that confirm the fact that their treatment is one of the most important things that can be done for diabetics, there are still dentists who do not insist on the way diabetes is supervised [15, 16, 17, 19].

In a similar way, the doctors are not used to supervise a variety of signs in order to determine if their diabetic patients can have oral health problems and they do not guide them to visit the dental offices. The result is that the majority of diabetics are not aware of the implications of the oral health that appear and which are associated to their disease and also of the significance of a preventive behavior [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14].

We have considered as a necessity a research that can establish the value of the oral health condition as a predictive index or as an assurance index of sugar diabetes in dentistry.

Materials and Methods. Studied Groups

The main objective of our research was the establishment of the value of the oral health condition as a predictive or assurance index of diabetes in dentistry.

In order to obtain the most accurate observations, incidences and informational correlations we have divided an experimental group - Target group (240 patients), called in a generic way: A group for oral health evaluation versus Diabetes, divided into 2 subgroups which were appropriate for our research: a declared diabetes patient versus an apparently healthy patient. For these patients' evaluation, who appeared in our research we elaborated a questionnaire, called Evaluation Questionnaire Of The Oral Health Condition where the questions

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focused on self treatment, prevention and diagnosis of diseases at the level of the oral cavity, on the degree of the use of dental services and on the diabetic adults' knowledge and attitudes towards the health of the oral cavity.

Those who participated at this questionnaire were the dentate patients who had as a diagnosis: diabetes. They belonged to the 2 groups analyzed during the research.

The questionnaire consisted of 29 items which were grouped into 5 categories. The questions intended to get information about:

- The patient's social position
- The oral health condition
- Self-treatment, prevention and self-diagnosis of oral cavity diseases
- The use of dental services
- Knowledge, values and attitudes related to oral health.

In order to get a relevant statistical analysis and some practical conclusions, most of the items were categorized. The items related to oral health habit were divided into two categories:

- Brushing at least twice a day versus more seldom
- Daily cleaning interdental space versus more seldom.

The items related to the use of dental services referred to:

- Dental visits at least once a year versus more seldom

Self-diagnosis of periodontal diseases was measured in two ways:

- By a current perception of bleeding gums
- By a current perception of the inflammation of the gums too.

Factors, based on the New Century model of oral health promotion were chosen for the analysis of the degree of self care of oral health by means of recording data.

Situational factors included age, gender and education.

Cognition (the patient's knowledge related to the approached topic) was evaluated with a question about knowledge: "Have you received information about the relationship between diabetes and gum diseases?"with an attitude statement: "I want to keep my natural teeth as long as possible" and with a self-related belief about the condition of oral health.

Behavior was assessed with questions about missing teeth, smoking habit and dentist last visited.

Affective factors were evaluated with a value statement: "Oral health is not as important as general health".

Alternatives for the statements were as follows: fully agree, almost agree, I do not know, almost disagree and fully disagree, but for the statistical analysis they were dichotomized into fully agree and almost agree as agree, and fully disagree and almost disagree as disagree; I do not know was classified as a missing value. The question about the condition of oral health was dichotomized to not good and good, instead of the five original alternatives, which were good, quite good, average, quite bad and bad.

Statistical significance for frequencies of the variables was analyzed with the Pearson Chi-Squared test. Logistic regression analysis was used to assess associations of frequent brushing, frequent interdental cleaning, frequent dental visits and the potential predictive factors. The level of significance was set at $p < 0,05$.

Results and Discussions

Recently, the result of a conference organized by the National Research Dental and Maxilo-Facial Institute and by the American Periodontology Academy was a conclusion based on the idea the dentists and the generalists must have a stronger collaboration. This is due to the more and more evidences towards the interdependence between oral diseases - cardio-vascular diseases and diabetes. The dentists become very responsible due to these evidences because they must recognize the oral problems that might have close connections with systemic manifestations and the generalists too who must improve their knowledge about oral diseases (American Dental Association Council 2003). An important aspect is that we have just begun to realize the purpose that can play the oral diseases for the systemic diseases although in dentistry it had been insisted a lot on the fact that the oral health was essential for the maintenance of the general health condition.

The oral complications which the most frequently are associated with diabetes include the gingivitis, periodontitis, toothless and the pathology associated at the level of soft tissues of the oral cavity [12, 16, 18].

Due to the fact that diabetics present a high risk for the development of some affection at the level of the oral cavity, it is needed to develop some prevention strategies in order to bring notice to dia-

betics about the last information towards oral health and in order to modify the diabetic population's perception towards this aspect.

The associations and connections between oral infections and serious systemic affects, as for example the diabetes, were evaluated in a current report of general surgery (U.S. Department of Health and Human Services, Oral Health in America National Institute of Health, National Institute of Dental and Craniofacial Research 2000).

The conclusion of this report was that oral health and systemic health are inseparable.

Consequently, we consider that the dentist must have a central role in the diabetic's detection and treatment.

As the dentist is part of health care team, working together with the patient's generalist and nutritionist too, one of his preoccupations must be the control of diabetes by prevention.

Thus, the patient's general examination must have an oral too and the treatment plan must consist of dental consultations and of an advanced training program of the rules of the dental hygiene habit.

The main objective of our research consisted of the establishment of the value of the oral health condition as a predictive or assurance index of diabetes in dentistry.

Thus, at the level of the target studied group made of 240 patients (120 diagnosed with diabetes versus 120 healthy patients) we have studied the main index of objectivity of the correlation between the oral health condition and the risk of diabetes called the Dental - Periodontal Diagnosis.

1. Oral health conditions an assurance index of diabetes

Those 120 patients of declared diabetes were divided on the basis of the dental-periodontal diagnosis variable as it follows:

- Marginal chronic periodontitis 37%
- Radicular remains 22%
- Chronic decayed lesions 19%
- Gangrene of pulp 11%
- Tartaric gingivitis 9%
- Chronic periapical lesions 2%

At the end of the comparative statistic tests of the influence of preexistent diabetic field (ANOVA) that corresponds to a major average of a deficient health condition at the level of our studied group we have realized the fact that between these tests some significant statistic differences appear in most cases.

The significance level of the test (p) is lower than the p value = 0,05, which is a reference value that corresponds to confidence interval of 95%.

Thus, at the end of the analysis of the correlation between oral health condition and diabetic field it may be said that the periodontal disease has superior and amazing percents in the case of the declared diabetes.

The correlation test demonstrates the fact that the periodontal disease is correlated to the diabetic risk (present versus silent) which is an assurance index of this one. The calculated (correlation coefficient) r = 0,317038 indicates this close relation.

2. Oral health condition a prediction index of diabetes

The distribution of those 120 patients without a diabetic history on the basis of dental-periodontal diagnosis variable was the following:

- Chronic decayed lesions 30%
- Marginal chronic periodontitis 29%
- Radicular remains 25%
- Gangrene of pulp 10%
- Chronic periapical lesions 5%
- Tartaric gingivitis 3%

The lower significant percentages obtained for each category of oral affection in the case of the patients without metabolic problems have motivated us "to aim" at those patients that had a combination of oral affections.

Thus, with the help of the crossed statistic tests used on the healthy patients group we obtained a group of 38 patients (31,7%) with an evident deteriorated oral health condition (radicular remains + periodontal disease + decayed lesions + tartaric gingivitis).

These patients were guided for a visit to expert diabetologists whom we had collaborated for entire time of our research.

Surprisingly, a quite big statistic percentage 20% (7 patients) were diagnosed with type 2 diabetes a fact that determined us to state that oral health condition may be a prediction index of diabetes.

The second objective of our research aimed to establish the significance that diabetics show towards their own oral health care.

Self treatment and prevention

• 38% of the patients reported that they brush their teeth more than once a day

• 44% reported that they brush their teeth once a day

• 17% reported that they brush their teeth less than once a day

The most used mean for interdental cleaning declared by the patients was:

• The toothpick . . . . . .51% of the patients

• The toothtread . . . . . .13% of the patients

• Interdental tooth brush . .11% of the patients

The patients' percentage that stated that they brush their teeth more than once a day is low (38%), a fact that needs attention if we take into consideration that the Dentists' Associations recommend brushing at least twice a day.

For the frequency of interdental cleaning the patient's distribution demonstrated the following values:

• 27% reported that they use an instrument for interdental cleaning at least once a day

• 48% reported that they use an instrument for interdental cleaning almost once a day

• 25% reported that they never use an instrument for interdental cleaning

The percentage of the subjects who brush their interdental surfaces regularly is low too (27%), because brushing, whether it is manual or by using an electric toothbrush it is not capable to reach the proximal and interdental areas. Any oral health care program or instructions meant to reduce the decays and the periodontal diseases must focus on the proximal and interdental areas too. Taking into consideration the obtained results the underlining of the interdental cleaning is very important among the adult diabetics.

Self - diagnosis

• 8% of the patients reported the perception of the bleeding gums at present

• 44% noticed such kind of experience in the past

• 36% never noticed a bleeding

• 12% could not answer the question.

When the subjects were asked to choose some alternatives from those 14 that presented symptoms of the oral diseases, the reported distribution was:

• The existence of tartar (33%)

• A fractured tooth (15%)

• Sensitive tooth (14%)

• Dry mouth (14%)

• 31% had claimed that not any of the symptoms at the moment

In case of self-evaluation of the oral health condition:

• 59% believed that their mouth was in a good condition

• 30% believed that their mouth was in a medium condition

• 9% believed that their mouth was in an almost bad or bad condition

• 2% could not appreciate

The use of professional dental care: 63% - 151 of the patients were once at the dentist in the latest year for:

• A routine visit

• A pain or another reason that needed an emergency treatment …….. 19%

When they were asked to explain the reasons for which they did not visit the dentist in the last 2 years, the most frequent reason was that they had not any problem, any pain (95%).

On the other hand, the patients' conception that it is not necessary to visit the dentist was the most used reason in order to explain the avoidance of a dental treatment the last two years. This attitude represents a considerable obstacle in improving oral health.

Almost 16% of the patients were guided by a generalist doctor to visit a dentist.

35% of the patients consider that they did not receive sufficient information about the prevention and the treatment of the periodontal diseases from the experts. The majority considered that it was important that the diabetologists, who had them under treatment, and their nurses to give them some pieces of advice about oral care too.

The bipolar associations between the care of the oral health habits and the factors with an explicative potential from New Century model, more exactly the bivariated associations of the oral health habits care with situational, cognitive, behavior and affective factors among the adult diabetics have helped us to obtain the conclusions of this research.

The regressive logistic analysis for the frequent care habits of the oral health has helped us to make correlations among the studied items.

Among the situational factors the feminine gender and the high degree of education proved to be strong factors that define the frequency of teeth brushing. Women and those who have a high educational level brush their teeth more frequent, a fact showed by the bivariable analysis too.

Only age (40 years old and over) and the latest visit to the dentist can be associated to the interdental cleaning frequency. The fact that tooth brushing and interdental cleaning are more frequent among over 40 years old patients than among young people is an encouraging one because of the high frequency the periodontal diseases among diabetics that belong to this group of age.

In the regressive logistic analysis age and education were not associated significantly to the frequent visits to the dentist, while the affective factors and cognition had a positive association.

The information about the relation between diabetes and the periodontal diseases is an important cognitive determinant for the frequent visits at the dentist. The percentage of the patients who reproached that they got insufficient information about the prevention and treatment of the oral health diseases from their experts (35%) coincides with the low level of general knowledge about these diseases which are low among adult diabetics.

Motivation is a very important affective factor in explaining the attitude related to the diabetics oral care. The role of the motivation was perceived correctly by the adult diabetics. The opinion of the majority (92%) is that the generalists and nurses who are taking care of diabetics have an active role in including the oral health education in the process of guiding. If diabetes is defined as a health public problem it will underline the significance of oral health especially in the case of prevention.

Conclusions

After the analysis of the multitude of data obtained the conclusions of our study are the following:

• The Health World Organization claimed that the promotion of oral self-care is one of the most important strategies of care of health for reaching the goal: "Health for all". The New Century model for health promotion offers an image based on former models about behaviors related to health. This can be summarized in this way: the patients' behaviors seem to consist of affective, cognitive and behavior factors which interactions in a complex structure with the time perspective and the patients' situation.

• We chose New Century model for this oral health promotion in order to study the oral self-care determinants although there are limits in all the models related to health behaviors for explaining the behavior complexity related to human health.

• The results of our research show that the situation of self-oral care may be improved among diabetics. The variety of factors for the promotion of oral health from New Century model helps to a better understanding of the complexity of the oral health promotion. More than this, because of the fact that some diabetics do not visit the dentist regularly, all expert diabetologists, nutritionists and their nurses too should be encouraged to join the effort of explaining the significance of oral health which is an integrated part of general health.

• Despite the evidence that show the close connection between diabetes and oral health diseases (especially periodontal diseases) and even if the recent studies confirm that the treatment of oral diseases is one of the most important things that can be done for diabetics, there are still a lot of dentists who do not send their patients to check their diabetes when there is such a case. There are also generalists who are not used to supervising a variety of signs in order to determine if their diabetic patients present the risk of having oral health problems [15,16,17,19]. They do not guide diabetics to visit the dental cabinets. Consequently, the majority of diabetics are not aware of the implications towards oral health associated to or generated by their disease and the significance of preventive behavior. This supervising deficiency generates terrible implications towards public health [20].

• Thus, we consider that the dentist role must be more involved in the case of diabetics and to collaborate faster and more actively with their generalist colleagues in the treatment of diabetes.

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