

Examining the relationship between type II diabetes with denture stomatitis

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ABSTRACT

Given the prevalence of denture stomatitis and different reports about the role of underlying medical conditions such as diabetes II in the outbreak of that, investigating the relationship between type II diabetes and denture stomatitis can be a help in discovering diabetes and taking care of uncontrolled diabetic patients who are likely to be at risk of denture stomatitis. This study aimed to determine the relationship between suffering from type II diabetes and the development of denture stomatitis on clients who came to the Iran University of Medical Sciences Endocrine Center, and was designed and implemented in a certain timeframe. This Historical –cohort study was done with tools like visualization, clinical examination, filling forms, investigating medical records and paraclinical experiments on the 59 edentulous patients with diabetes Type II and 53 non-diabetic edentulous patient who were similar in age, sex, smoking, hygiene and xerostomia. They had no background of Anemia, Radiotherapy and immune deficiency. Sampling was done based on the objective and the denture stomatitis lesions were checked and recorded. After controlling the similarity of the data gathered from the experimental and control groups, the frequency of denture stomatitis was statistically analyzed by Chi2 or Exact Fisher method; and the relative risk of type II diabetes with prevalence of denture stomatitis was determined in the samples and the scales of that was estimated in statistical population. Of the 59 in the case group 22 (%37/2) and of the 53 in control group, 11 (%20/8) suffered from denture stomatitis. Given the significant difference between the frequency of denture stomatitis in control and experimental groups ($p < 0/006$), we must pay more attention to the diabetic patients oral lesions and we have to be optimal in discovering diabetes and introducing the patients to doctors.

KEY WORDS: Type II diabetes, Denture Stomatitis

INTRODUCTION

Oral conditions that occur in diabetic patients include burning sensation in mouth, impaired wound healing, dry oral mucositis, ulcers, opportunistic viral, bacterial and fungal infections [1,2]; among the inflammatory signs of oral mucositis in diabetic patients, Denture stomatitis* with fungal causative agent has been mentioned [1] meanwhile in diabetic patients that their diabetes is undiagnosed or treated inadequately, the possibility of generalized stomatitis is considerable.

Candida species colonization, especially Albicans in the tissue surface of denture depends on several factors. The most important factors that influence the relationship between microbes and host and increase the sensitivity to candida denture stomatitis are: age, malnutrition, Immunodeficiency, irradiation and diabetes [3,4].

Untreated Denture stomatitis can cause a burning sensation in the mouth, extends in to pharynx areas and even in immunocompromised patients cause systemic fungal infection.⁵

In researches from outside the country, the prevalence of denture stomatitis in type II diabetic patients is reported more than the control group [5-11].

According to the defects on some of the studies and information vacuum in Iran, this study which aimed to determine the relationship of diabetes type II and control group with the detection of dentures Stomatitis in clients who come to Endocrinology and Metabolism Center in Iran University of Medical Sciences was done in the certain timeframe.

* Denture stomatitis: is the common type of oral candidiasis that in the Maxillary areas under the denture and the in alveolar ridges show itself in the form of inflammatory. Progressive steps of that are as follows:

First, the incidence of spots like petechial, second, expanded erythema which in gages most of the mucosa covered by the denture and the third stage involves the development of granulation tissue or nodularity (Papillary hyperplasia) [1].

MATERIALS AND METHODS

This historical –cohort study was done with tools like visualization, clinical examination, filling forms ,investigating medical records and paraclinical experiments on the 59 edentulous patients with diabetes type II (a specialist in Endocrinology and Metabolism took the responsibility of detecting the disease based on the reference 4) that used mandible and maxillary denture , except with hypoglycemic drugs, other medications were not given , they didn't suffer from any anemia , at least they had used their denture for a month and they didn't have any background of radiotherapy or primary and secondary immune deficiency. We had 53 members in control group.

The control group included relatives of diabetic patients came to the Endocrinology and Metabolism center in University of Medical Sciences. These people didn't have any diabetes (FBS: Fasting Blood sugar < 100) and in regard to age, sex, smoking [12], dry mouth [13] and oral hygiene were similar to the case group .they didn't use any drugs , didn't suffer from any type of anemia or immune deficiency , no background of radiotherapy and at least they had used their denture for a month .

Written consonant for cooperation in the research was obtained from the members of the statistical society and the approval of the administrative investigation was received.

The sample size was determined based on a pilot study on 13 diabetic and 6 non diabetic patients . because of 6 (42/2%) in case group and 1 (%16/6) in control group , with %95 confidence level and %90 statistical power and also because of the difference in the incidence of denture stomatitis ,this study was done on the 112 people (59 in case group and 53 in control group) .sampling was according to the purpose.

Variables such as : as age, sex, marital status, oral hygiene, smoking, dry mouth, use of drugs other than hypoglycemic drugs, types of anemia, poor safety [1],having background of radiation, suffering from diabetes type II, burning sensation in mouth, the way of controlling diabetes type II(based on the quantity of HbA1C in patient's blood : less than 1 % is good ,between 1-2 % is moderate and poor control for the quantity more than 2%), denture stomatitis , type of denture stomatitis and the time span of using denture were investigated.

Detecting denture stomatitis and its type was done through observation and clinical examination on the basis of reference [1]. Other required information about the variables was received through oral questions, filling information forms, investigating medical records and if necessary paraclinical experiments.

After intraoral examination of the under study population and recording and classifying the properties of the samples, the data were statistically analyzed by Chi-square and Exact Fisher tests.

Of the 112 samples (59 in case group and 53 in control group) 22 in case group (37/2%) and 11 in control group (20/8%) suffered from denture stomatitis. Chi-square test showed that this difference is statistically significant (p <0/006) so the risk of getting denture stomatitis in type II diabetic patients is 8/1 times more than non-diabetes type II with denture : RR= 1/8 and the risk about the role of diabetes type II in getting denture stomatitis is equal to 5/16 percent.

Table 1. Distribution of subjects based on suffering from denture stomatitis to the separation of diabetes type II

Denture stomatitis	NO	YES	TOTAL
Diabetes type II			
NO-(CONTROL) – N1-53	42(79/2)	11(20/8)	53(100)
YES – (CASE) N2-59	37(62/8)	22(37/2)	59(100)

About the role of controlling diabetes and getting denture stomatitis ,our results showed that among controlled diabetic patients 7 (22/6%) and among uncontrolled diabetes 15 (6/53%) people suffered from denture stomatitis . Chi-square test showed that the difference is statistically significant (p<0.005) and the relative risk of controlling diabetes improperly on the development of denture stomatitis is equal to 2/4 times.

Investigating the relationship between type II diabetes and burning sensation in the mouth showed that in control group 11(21%) and in case group 20 (34%) people had burning sensation in their mouth. Chi-square test did not prove this significant difference (p<0/5).

DISCUSSION

The findings of this study showed a statistically significant association between type II diabetes and denture stomatitis. This means that if a type II diabetic patient suffers from dentures, the possibility of getting denture stomatitis for them is 1/8 times more than those without diabetes type II. This finding proved the results of researches by Bobkowska [8], Shulman [9] in 2004, Darklin [10] in 2001 and Shwartz S. Miller [11] in 2002.

Bobkowska's research in 2002 on 70 type II diabetic patients and 58 healthy non-diabetic subjects, reported the possibility of getting denture stomatitis in diabetic subjects for 56 percent and 36/2 percent for non-diabetic subjects [8].

Also Shulman et al. in 2004 [9] introduced type II diabetes as a risk factor of getting denture stomatitis.

Darklin et al. in 2001 reported a significant statistical difference in terms of getting denture stomatitis between those with diabetes and those without diabetes.

In this study the development of denture stomatitis is reported 51% for diabetic patients and 31/2 % for healthy individuals.10

Schwartz Miller et al. in 2002 studied on the 195 people with denture stomatitis and he introduced getting diabetes as an effective factor in the prevalence of denture stomatitis.11

In contrast to the findings above, H. Shirat's researches in 1998 on the 194 rats that had received streptozotocin injection to get diabetes (92 rats showed diabetes and they were considered as diabetic group and 84 didn't have any signs of diabetes and were considered as non-diabetic group) and acrylic denture showed that inflammatory signs or special changes between two groups do not have any statistically significant difference.

In our study, uncontrolled diabetic patients significantly suffered from denture stomatitis more than those with controlled diabetes. It is clear that glycemic control can influence possible conditions like changes in the thickness of the epithelium and host defense responses which are effective in development of denture stomatitis.

This factor was not considered in previous researches.

Based on the current study, 21% in control group and 34% in case group had burning sensation in their mouths, that this difference is not statistically significant.

Finally, in order to justify a higher frequency of denture stomatitis in diabetic patients we can indicate that diabetes causes some changes in the host immune cells like polymorpho nuclear leukocytes, monocytes, and the macrophages function.1,2

On the other hand, candida works as an endogenous infective factor on the tissue trauma caused by denture. In addition, the macrophages and monocytes increased susceptibility to bacterial and fungal antigens and producing more cytokine, proinflammatory mediators and collagenase in diabetic patients cause a higher degradation and loss in the thickness of the mucous epithelium [1,2].

CONCLUSION

Finding a significant relationship between type II diabetes and the prevalence of denture stomatitis can attract dentists to their role in detecting diabetes among the denture stomatitis patients. Moreover, The collaboration between physicians and dentists in taking care of patients with uncontrolled type II diabetes who are likely at risk of denture stomatitis, can reduce these patients' problems.

Offers

- 1- Allocating a part of patients' medical records to oral examination in Endocrinology and metabolism assessment centers.
- 2- Making close relationship between physician and oral diseases (dental) specialists in order to screen patients, prevent and control diabetes and related oral conditions.

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