

PREVALENCE OF PERIODONTITIS IN DIABETIC AND NON-DIABETIC PATIENTS

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Received: 05 May 2015, Revised and Accepted: 11 June 2015

ABSTRACT

Objective: Periodontitis is a chronic inflammatory condition characterized by destruction of periodontal tissues and resulting in loss of connective tissue attachment, loss of alveolar bone, and formation of pathological pockets around the diseased tooth. Diabetic patients are more prone to periodontal diseases as they are more susceptible to infections. Studies have proved that periodontitis can be considered as a complication of diabetes.

Method: A total of 50 individuals will be surveyed in this study. 25 patients aged 40-60 years with diabetes and 25 non-diabetic controls in good general health aged 40-60 years. All subjects will be given clinical periodontal exam for probing depth, attachment loss, bleeding on probing, the presence of plaque and calculus, and alveolar bone loss.

Expected Outcome: Increase in periodontitis is expected to be seen in the diabetic patients as compared to the non-diabetic group. Thus, periodontitis is expected to be considered as a complication of diabetes.

Result: The result showed that diabetes is a significant risk factor in diabetes.

Conclusion: Increase in periodontitis is expected to be seen in the diabetic patients as compared to the non-diabetic group. Thus, periodontitis is expected to be considered as a complication of diabetes.

Keywords: Periodontitis, diabetes, probing depth, plaque, calculus

INTRODUCTION

Periodontitis is a common chronic inflammatory disease characterized by destruction of the supporting structures of the teeth mainly the periodontal ligament and alveolar bone. Their classification is complex and takes into account the clinical presentation, age at diagnosis, rate of disease progression, and systemic and local factors that may increase risk. Periodontal diseases include gingivitis (in which the inflammation is confined to the gingiva and is reversible with good oral hygiene) and periodontitis (in which the inflammation extends and results in tissue destruction and alveolar bone resorption) [1].

Tissue destruction in periodontitis results in the breakdown of the collagen fibers of the periodontal ligament, resulting in the formation of a periodontal pocket between the gingiva and the tooth. "Pocketing" is not evident on simple visual inspection, and assessment using a periodontal probe is essential. Periodontitis is a slowly progressing disease, but the tissue destruction that occurs is largely irreversible. In the early stages, the condition is typically asymptomatic; it is not usually painful, and many patients are unaware until the condition has progressed enough to result in tooth mobility. The pockets deepen as a result of the further destruction of fibers of the periodontal ligament (referred to as attachment loss; Fig. 1) and the resorption of the alveolar bone that occurs in parallel with the progressing attachment loss. Advanced periodontitis is characterized by gingival erythema and edema, gingival bleeding, gingival recession, tooth mobility, drifting of teeth, suppuration from periodontal pockets, and tooth loss [2].

Diabetes mellitus is a metabolic disorder characterized by hyperglycemia due to defective secretion or activity of insulin [3]. It may be further complicated by poor regulation of protein and lipid metabolism. In the current classification of this condition, the terms "insulin-dependent diabetes mellitus" and "non-insulin dependent diabetes mellitus" are not used, in part because they relate to treatment rather than to the diagnosis. A conclusive diagnosis of diabetes mellitus

is made by assessing glycated hemoglobin levels. In those people with diabetes, sequential fasting plasma glucose levels will be 7 mmol/L or more.

Diabetes mellitus can be classified into 1 of 4 broad categories according to signs and symptoms.

Type 1 diabetes mellitus is normally a result of autoimmune destruction of the beta cells in the islets of Langerhans of the pancreas. This condition often leads to absolute insulin deficiency. Type 1 diabetes tends to occur in young, lean individuals, usually before 30 years of age; however, older patients do present with this form of diabetes on occasion.

With Type 2 diabetes, patients can still produce insulin but do so relatively inadequately. In many cases, the pancreas produces larger than normal quantities of insulin. A major feature of Type 2 diabetes is a lack of sensitivity to insulin by the cells of the body, particularly fat and muscle cells. These larger quantities of insulin are produced as an attempt to get these cells to recognize that insulin is present.

There is emerging evidence to support the existence of a two-way relationship between diabetes and periodontitis, with diabetes increasing the risk for periodontitis, and periodontal inflammation negatively affecting glycemic control [4,5].

The aim of this study is to prove the relationship between diabetes mellitus and periodontal diseases by taking the Russell's periodontal index score for diabetic patients.

METHODS

A total of 50 individuals were surveyed between the age group 40-60 years in this study. 25 patients with diabetes and 25 non-diabetic controls in good health. All subjects were given clinical periodontal exam for probing depth, attachment loss, bleeding on

probing, the presence of plaque and calculus, and alveolar bone loss using Williams Periodontal Probe. The scoring was done using Russell's periodontal index.

An assessment tool, named after A. L. Russell, a contemporary American dentist that estimates the degree of periodontal disease present by measuring gingival inflammation and bone loss. It is used for measuring periodontal disease in population surveys. Each tooth is scored separately according to defined criteria; the higher the score, the more marked the periodontal disease. The population score equals the average for the individual scores in the population examined.

Periodontal disease index of Russell.

Score

No gingivitis (neither overt inflammation in the investing tissues nor loss of function due to the destruction of supporting tissues).

Normal radiographic appearance:

- 0 - Mild gingivitis (overt area of inflammation in the free gingiva but this area does not circumscribe the tooth).
- 1 - Gingivitis (inflammation completely circumscribes the tooth, but there is no apparent break in the epithelial attachment).
- 2 - Not used in the field study. Early, notch-like resorption of the alveolar crest.
- 4 - Gingivitis with the pocket formation (the epithelial attachment is broken, and there is a pocket). There is no interference with normal masticatory function, the tooth is firm in its socket and has not drifted. Horizontal bone loss involving the entire alveolar crest, up to half of the length of the tooth root (distance from apex to the cemento-enamel junction).
- 6 - Advanced destruction with loss of masticatory function (tooth may be loose, tooth may have drifted, tooth may sound dull on percussion with a metallic instrument, and the tooth may be depressible in its socket).
- 8 - Advanced bone loss, involving more than half of the length of the tooth root, or a definite intrabony pocket with the definite widening of the periodontal membranes. There may be root resorption or rarefaction at the apex.

Table 1: Survey on the prevalence of periodontitis among the diabetic and non diabetic patients.

Diabetic/non-diabetic	Patients having periodontal diseases	Periodontally healthy
Diabetic patients (25)	15	10
Non-diabetic patients (25)	4	21

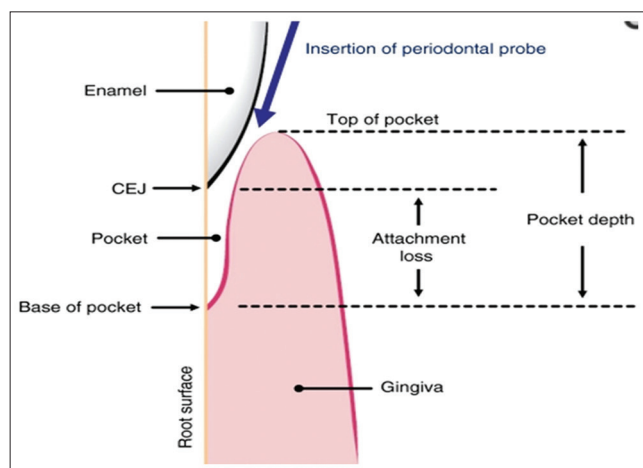


Figure 1: Periodontal Pocket

RESULTS

According to the survey done out of 25 diabetic patients examined, 15 patients were found to have established periodontal disease and 10 were periodontally healthy. Whereas among the 25 non-diabetic patients examined, only 4 were found to have periodontitis, whereas 21 were periodontally healthy (Table 1).

CONCLUSION

The study confirms that diabetes is a significant risk factor for periodontitis, and the risk of periodontitis is greater if glycemic control is poor; people with poorly controlled diabetes (who are also most at risk for the other macrovascular and microvascular complications) are at an increased risk of periodontitis and alveolar bone loss [1,6].

Given the predicted increases in the prevalence of diabetes over the next few decades, we will probably see reductions in the prevalence of periodontitis (associated with less smoking and better oral healthcare behaviors over recent years) as a result of large increases in the number of people with diabetes [7]. Controlling diabetes (i.e., improving glycemic control) are likely to reduce the risk and severity of periodontitis.

It is very important for diabetic patients to maintain proper oral hygiene to prevent any bacterial invasion which can further increase the risk of periodontitis.

DISCUSSION

As established from the survey, the people with diabetes are more prone to periodontitis. These patients had significantly more clinical attachment loss than the healthy individuals. In another similar cross-sectional study by Bridges *et al.* [8], it was found that diabetes affected all periodontal parameters, including bleeding scores, probing depths, loss of attachment, and missing teeth. In fact, one study has shown that diabetic patients are 5 times more likely to be partially edentulous than non-diabetic subjects [9]. People with Types 1 and 2 diabetes appear equally susceptible to periodontal disease and tooth loss.

Other factors are involved in the high prevalence of periodontal diseases in association with diabetes. A recent study found that smoking increases the risk of periodontal disease by almost 10 times in more in diabetic patients [10]. According to these results, the management of diabetic patients should include strong recommendations to quit smoking. For both Type 1 and 2 diabetes, there does not appear to be any correlation between the prevalence or the severity of periodontal disease and the duration of diabetes [9,11].

Recent investigations have attempted to determine the two-way relationship between diabetes and periodontitis if the presence of periodontal disease influences the control of diabetes. There have been recent studies which support this hypothesis. Grossi *et al.* [12] have suggested that effective control of periodontal infection in diabetic patients reduces the level of advanced glycation end-products in the serum. The level of glycemic control seems to be the key factor. Tervonen and Karjalainen [13] examined diabetic patients and non-diabetic controls for 3 years. They found that the level of periodontal health in diabetic patients with good or moderate control of their condition was similar to that in the non-diabetic controls. Those with poor control had more attachment loss and were more likely to exhibit recurrent disease. This phenomenon has been pointed out by other researchers too [14-16]. From these evidences, we can conclude that prevention and control of periodontal disease must be considered an integral part of diabetes control.

The principles of treatment of periodontitis in diabetic patients are the same as those for non-diabetic patients and are consistent with our approach to all high-risk patients who already have periodontal disease. Major efforts should be directed at preventing periodontitis in patients who are at risk of diabetes. Diabetic patients with poor metabolic control should be seen more frequently, especially if periodontal disease

is already present. Patients with well-controlled diabetes who have good oral hygiene and who are on a regular periodontal maintenance schedule have the same risk of severe periodontitis as non-diabetic subjects.

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