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Current Perspectives of Periodontal Disease (PD) and Diabetes Mellitus (DM)

Hiroshi Bando[1,2*]
[1]Medical Research/Tokushima University, Tokushima, Japan
[2]Japan Low Carbohydrate Diet Promotion Association (JLCDPA), Kyoto, Japan

Corresponding Author: Hiroshi BANDO, MD, PhD, FACP ORCID iD
Address: Tokushima University /Medical Research, Nakashowa 1-61, Tokushima 770-0943, Japan. Tel: +81-90-3187-2485. Email: pianomed@bronze.ocn.ne.jp
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Abstract

Combination of diabetes mellitus (DM) and periodontal disease (PD) has been a problem. Diabetic cases with PD showed elevated odds ratio (OR) compared to those without PD, where retinopathy 2.8-8.7, nephropathy 1.9-8.5, neuropathy 3.2-6.6, cardiovascular complications 1.3-17.7, and mortality 2.3-8.5. Medical and dental staffs always manage to check DM and PD.

Keywords

Diabetes Mellitus, Periodontal Disease, Odds Ratio, Type 2 DM, Periodontitis

Abbreviations

DM: Diabetes Mellitus; PD: Periodontal Disease; OR: Odds Ratio; T2DM: Type 2 DM

Diabetes mellitus (DM) has been increasing and highly prevalent worldwide [1]. The association of DM and periodontal disease (PD) has been a problem [2]. PD has been recognized as the 6th common diabetic complication. Between periodontitis and type 2 DM (T2DM), consistent evidence has been present as a dual directionality [3]. Various clinical problems are caused in diabetic patients with PD [4]. Current trend for DM and PD will be described from several points of view in this article.

For clinical studies, several recent reports were observed. A meta-analysis was performed from 3987 diabetic cases in 8 articles [5]. Mutual association among PD, nephropathy, and retinopathy was studied. The results showed that PD has elevated total microvascular complications (odds ratio, OR, 1.96). Furthermore, PD showed higher nephropathy (OR 1.55) and retinopathy (OR 3.77). Thus, PD is proved to be present more in diabetes and larger clinical study will be required in the future.

From a systematic review, the association of PD and diabetic complications was investigated [2]. It analyzed OR from 14 studies concerning micro-/macro-vascular complications. In comparison with DM without PD, diabetic cases with PD showed elevated OR. The results were retinopathy 2.8-8.7, nephropathy 1.9-8.5, neuropathy 3.2-6.6, cardiovascular complications 1.3-17.7, and mortality 2.3-8.5.

Regarding the combined problem of DM and PD, dental evaluation and basic analyses are crucial. A recent report showed the analyses of 182 diabetic patients with PD [6]. The protocol included HbA1c, preprandial glucose, the remaining number of teeth, clinical attachment level (CAL), presence of suppuration (SUP), probing depth, bleeding on probing (BoP), and others. As a result, two groups (HbA1c ≥7% vs HbA1c <7%) revealed a significant difference for markers, which were 18.5 vs 20.4 in remaining teeth, 4.5 vs 4.1 mm in CAL, 3.78 vs 3.42 mm in probing depth. Consequently, cases in poor control showed the severer situation of PD than those in better control.

The actual dental condition of PD is important, and it can be evaluated by the application of a Periodontal Inflamed Surface Area (PISA) Index. Using PISA, 104 T2DM cases were investigated [7]. The result showed that an increase of each 10mm^2 of PISA would bring OR of 2% increase in HbA1c level. This paper gives evidence-based data for this clinical issue.

From a basic medicine point of view, periodontal pathogens would bring cytokine production and oxidative stress leading to dysfunction of insulin sensitivity [8]. Chronic inflammation of gum around the teeth continues for long, which comes from biofilm accumulation by improper oral hygiene. Biofilm has >1000 kinds of microorganisms, such as Porphyromonas Gingivalis, and Tannerella Forsythia, and so on [9]. They contribute to the perpetuation of PD, causing impaired support of periodontal tissue and bone.

In usual clinical practice, patients with DM and PD were often observed. Research for chairside screening for undiagnosed diabetes mellitus (UDM) was conducted (n=7343) [10]. The results showed that UCD was 5.6%, obesity, and toothless jaw was 12.6%, obesity and PD was 12.2%. From the questionnaire study of PD and hygiene habits, proper oral health education was proved to be required [11]). In summary, medical and dental staffs always keep adequate management of evaluating DM and PD.

Conflict of Interest

The author has read and approved the final version of the manuscript. The author has no conflicts of interest to declare.

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