



EDELWEISS PUBLICATIONS
OPEN ACCESS

<https://doi.org/10.33805/2572-6978.136>

Volume 4 Issue 1 | PDF 136 | Pages 3

Dental Research and Management

Commentary

ISSN: 2572-6978

Recent Trend from the Clinical Point of View for Periodontitis and Diabetes Mellitus

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Citation: Sakamoto D and Bando H. Recent trend from the clinical point of view for periodontitis and diabetes mellitus (2020) *Dental Res Manag* 4: 8-10.

Received: Dec 27, 2019

Accepted: Jan 31, 2020

Published: Feb 05, 2020

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Keywords: Periodontitis, Diabetes mellitus, European federation of periodontology, International diabetes federation, British society of periodontology.

Abbreviations: EFP-European Federation of Periodontology, IDF-International Diabetes Federation, BSP-British Society of Periodontology, QOL-Quality of Life, ADL-Activities of Daily Living.

Diabetes has been recognized as a risk factor for periodontitis for long. The risk of periodontitis has been increased 2-3 times in diabetic patients in poor control than individuals without [1]. Periodontitis may influence not only QOL/ADL of diabetic patients, but also various systemic conditions such as cardiovascular disease [2]. In the world, advanced periodontitis is said to be the 6th most prevalence in all human diseases [3]. According to the National Health Service (NHS) of United Kingdom, advanced periodontitis has been observed in 8% of the adults [4].

The etiological aspect of diabetes and periodontitis are based on the chronic inflammation of oral gums [1,2]. Such patients with periodontitis are known to have elevated risk for impaired glucose variability and insulin resistance. Furthermore, there are mechanic links between them, including elevated values of interleukin (IL)-1-β, Tumor Necrosis Factor (TNF)-α, IL-6, receptor activator of nuclear factor-kappa B ligand/osteoprotegerin ratio, oxidative stress and so on [5,6].

From historical point of view, discussions have continued concerning diabetes and periodontal disease. The manifesto of EFP was formerly presented [5]. It was for medical and dental professionals, and it provided all healthcare professionals several necessary factors, including links, regular periodontal monitoring, mutual communication between medical and dental staffs, and particular collaboration for suspected diabetes cases.

Successively, the consensus report and guideline were presented [6]. It was both of the EFP and the American Academy of Periodontology (AAP) that recommended several steps for medical professionals and dental professionals. Those reports included links of both diseases, regular visit to dentist, periodontal assessment in the new case, liaising with physician in suspected diabetes. The strategy was impressive for the dentist to check potentially a chair-side HbA1c test. These processes were useful for prevention of the exacerbation of the both diseases in early stages [6].

Furthermore, British Society of Periodontology (BSP) has showed the consensus report concerning both diseases. Among them, there were some representative comments for medical professional. It included indicating the links of both diseases to diabetic patients, and advising them to receive the dental assessment in the dentistry [7]. BSP also showed other comments for dental professionals. They included prevalence of the links of both diseases, submission of the HbA1c values and mutual connections with diabetologist concerning detail information of diabetes in the usage of template letter each other [8].

For dental region, the standard guide was shown for adequate management of periodontology, which was from BSP. These points have been included, informing the links, asking HbA1c levels, continuing the relationship with the physician and so on [9]. The most recent proposal was the Consensus report and guidelines on periodontitis and diabetes [10,11]. It was presented on the joint conference by the International Diabetes Federation (IDF) and the European Federation of Periodontology (EFP). This guideline was published from both of *Journal of Clinical Periodontology* and *Diabetes Research and Clinical Practice* [11].

The content was for medical and dental professionals. There were comments for the medicals including i) Enquire the symptoms of periodontitis, ii) Inform patients the links, iii) Refer the patients for periodontal assessment, iv) Recommend regular visit to dentist and v) Collaboration with the dentistry. Furthermore, there were comments for the dentals including i) Inform patients the links, ii) Continue regular Periodontitis (PD) monitoring, iii) Enquire HbA1c values, iv) Cooperate physician to assess the risk of diabetes and pre-diabetes and v) Taking the advantage of validated screening questionnaire [10]. Thus, necessary information can be freely obtained through the EFP homepage [12].

As mentioned above, several crucial points have been found in standard guidelines. They include that i) They has been a bidirectional relationship between diabetes and periodontitis including advanced gum diseases, ii) There have been not enough actual communication between medical and dental professionals, iii) Patients with diabetes

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and periodontitis have been treated and controlled by both medical and dental departments, iv) The reduction of HbA1c value would bring effective treatment of periodontitis about 3-4 mmol/mol [13]. A conversion formula has been known about HbA1c, where IFCC value (mmol/mol)=10.93 × NGSP value (%) -23.52 (mmol/mol).

From clinical point of view, there have been some researches concerning diabetes and periodontitis. C-Reactive Protein (CRP) is a potential pro-inflammatory biomarker, and high sensitivity CRP was positively associated with periodontitis, smoking and obesity [14]. Chronic periodontitis would be influenced by the values of CRP, IL-6 and LK-10 [15].

In addition, Homeostasis Model Assessment for Insulin Resistance (HOMA-R) level significantly predicts periodontal inflammation [16]. From the data of 77 thousand patients with diabetes and periodontitis in 6 countries, the results showed that patients with periodontitis have higher ratio of developing pre-diabetes and diabetes, in which adjusted HR range was 1.19-1.33 [17].

In relation to diabetes and periodontitis, authors and colleagues have continued clinical practice and research [18]. Among them, we have clarified the efficacy of Low Carbohydrate Diet (LCD) and comparison with Calorie Restriction (CR) [19]. Furthermore, we had treated diabetic patients with various complications, including macroangiopathy, microangiopathy, periodontitis and so on. Through our clinical experiences, treating periodontitis would be crucial for better diabetic control [20]. Periodontitis exacerbates chronic inflammation of gums and supporting tissues of teeth such as alveolar jaw bone [1]. Persisting inflammatory condition develops progressive tissue damage and teeth loss [1,21]. Periodontitis may lead to cardiovascular diseases and metabolic syndrome with persistence positive results of CRP [1,21].

From the pathophysiological point of view, the aggravating mechanisms with diabetes and periodontitis have not been completely understood. However, it is the glycemic control condition that can decide the key for developing the risk [19]. As the glucose control becomes worse, the risk of periodontitis would be increased [22]. In contrast, as the periodontitis becomes worse, the glucose control would be aggravated [23]. From the statistical data of meta-analyses and Cochrane reviews, HbA1c value showed the reduction of 3-4 mmol/mol after receiving successful periodontal treatment after the treatment for several months [13,24].

For actual clinical practice in various situations, there have been rather difficulties about smooth collaborative relationship between medical and dental departments [25]. However, some improvement has been found between them because of better mutual relationship by the usage of common guideline [19]. The reasons seem to be from the following factors: i) The research of the relationship between HbA1c and periodontitis has known, ii) Useful and relevant guidelines have been introduced, iii) Clinicians can introduce and treat such patients together, by usage of mutual referral letters, iv) The necessity of combined treatments in both clinics have been known widely including primary care physicians and v) Patients also came to know the beneficial collaborative therapies in medical and dental clinic [10].

In summary, recent trend about diabetes and periodontitis has been discussed. Several important points are to be emphasized. They are i) Diabetes and periodontitis have mutually bidirectional influence, ii) Effective treatment of periodontitis can bring reduction in HbA1c up to 3-4 mmol/mol, and iii) The joint management of dentist and physician would be recommended. This article would be expected to become a reference for beneficial treatment and management in the clinical practice.

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