

Research Protocol

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Proposed School/ Discipline	Taibah University Tanta University

1. Project/ research title

The Effects of Non –Surgical Periodontal Therapy on Glycemic Control and Periodontal Health in Diabetic Patients with Periodontitis (Randomized Controlled Clinical Trial)

2. Project/ Research Summary

The aim of the present study is to monitor the clinical outcomes and the metabolic response of non-surgical periodontal therapy in patients with chronic periodontitis and uncontrolled type 2 diabetes.

Regarding clinical and metabolic parameters at baseline, no differences will be displayed between two groups. However, at 3-months follow-up period the patients within a test group will demonstrate better clinical outcomes than patients in a control group

3. Project/ Research details

3.1. Introductory background

The relationship between chronic periodontitis and diabetes has been the aim of the most intensive research [1]. Many studies suggested the concept of a two-way relationship between both diseases [2]. Type 2 diabetic(T2DM) patients show a higher extent, severity, and prevalence of chronic periodontitis than healthy subjects [3]. Accordingly, T2DM is considered a risk factor for chronic periodontitis [4]. Simpson et al .,(2010) observed that the deterioration of glycemic control attributed to chronic periodontitis over time[5]. Periodontal therapy can decrease local inflammation, the systemic entry of pro-inflammatory molecules and bacterial by-products such as lipopolysaccharides [2]. Simpson et al .,(2015) reported that many researches have studied the relationship between glycemic control and periodontal therapy (non-surgical modality) in the diabetic population and have demonstrated contradictory findings[6]. Several clinical trials recommended that more studies are necessary to clarify this link ([7]; [5]; [8]. Therefore, the aim of this clinical trial is to study the influence of non-surgical periodontal therapy on the glycemic level among T2DM patients with chronic periodontitis.

3.2. Research questions

Is the non-surgical periodontal therapy can improve glycemic control in type 2 diabetic patients with chronic periodontitis?

Null hypothesis is the non-surgical periodontal therapy doesn't improve glycemic control in type 2 diabetic patients with chronic periodontitis

3.3. Aims/Objectives of the project

The objective of the current clinical study is to evaluate the clinical and the metabolic effects of non-surgical periodontal therapy in patients with chronic periodontitis and uncontrolled type 2 diabetes.

3.4. Significant/Contribution to the discipline

In the present three- month controlled clinical study, an important aspect is a creation of an optimal non-surgical periodontal therapy (NSPT) (consist of OHI, SRP, combination of antibiotics, and antiseptics), versus no active therapy in control group, to enhance the probability of detection any impact of periodontal therapy on the HbA1C level. In the field, this maximization is unique because previous clinical trials either provided potentially effective periodontal therapy for control groups such as study of Engebretson et al., (2013) who stressed on oral hygiene instructions for control patients[9] or provided sub-optimal periodontal therapy such as study by Gay et al., (2014) who studied the impact of periodontal treatment composed of OHI and SRP alone[10].

In diabetic patients the data on the influence of periodontal treatment on metabolic control are contradictory. Some publications have reported that NSPT may improve metabolic control [11], [5], [12], [13], [14]. However, in these patients, other studies cannot demonstrate significant improvement of glycemic control[7], [15], [16], [17], [6].

3.5. Theoretical framework and methods/approach

Methodology (The methodology, design, and materials, sample and sampling technique, description of study tools to be used).

A prospective, randomized controlled clinical trial will be conducted on two parallel groups with three months follow-up period. A convenient sample of 44 patients aged 40-70 will be recruited.

Test group (patients will give immediate periodontal therapy)

Control group (patients will give delayed periodontal therapy)

The subjects with uncontrolled type 2 diabetes (HbA1c from 7% to 9%) will be selected from attendants of Internal Medicine Outpatients Clinic, Tanta University Hospital and will be referred to Periodontology Department, Tanta University.

Closed envelopes technique will be used for random allocation of the study participants that identify to which group the subjects will be enrolled, using 1:1 allocation ratio. All patients will sign informed consent

Inclusion criteria

- Diagnosis of diabetes type 2 for more than five years
- Type 2 diabetes with HbA1c level from 7% to 9% at the last medical evaluation
- Age from 40 to 70 years
- No change of diabetes treatment over the previous three months
- Diagnosis with chronic periodontitis
- Minimum sixth permanent teeth excluding third molars
- Clinical attachment level (CAL) and pocket depth (PD) ≥ 4 mm in more than thirty percent of the sites

Exclusion criteria

- Pregnancy
- Alcoholism and smoking
- Presence of any systemic disorders other than hypertension and diabetes
- Diabetic major complications
- Antimicrobial therapies in the last 6 months
- Periodontal therapies in the last 6 months
- Allergy to metronidazole and amoxicillin

Intervention protocol

Periodontal therapy will include scaling and root planing (SRP), combination of systemic antibiotics [metronidazole 400 mg three times daily for two weeks and amoxicillin 500mg three times daily for two weeks] and oral hygiene instructions (OHI). Full-mouth SRP will be performed by the same specialist for all patients in a test group using ultrasonic apparatus and Gracey curettes in a single two-hour session. Local anesthesia will be applied when needed. SRP will be associated with subgingival irrigation by chlorhexidine 0.12% mouthwash. Immediately, after SRP, the administration of antibiotics combination will be started and patients will receive a free dental care products necessary for periodontal maintenance during a follow-up period (three months). For the patients within a control group delayed periodontal therapy will be performed using the same procedures that will be applied for the patients in a test group exactly after the end of follow up period (three months) because of ethical reasons. Therefore, within the control group, no periodontal therapies will be done during the follow-up.

Clinical and metabolic follow-up

A complete medical history, socio-demographic data, and information regarding daily dental care will be collected for all patients. Charting for the full-mouth periodontium using a periodontal probe will be performed by the same specialist. This includes PD, CAL, bleeding on probing and the visible dental plaque. The periodontal evaluation will be done at baseline and at three months. Blood will take from a peripheral vein to monitor HbA1c using high-performance liquid chromatography at baseline and at three months post-treatment.

Data analysis (The proposed method of data analysis)

Data will be coded, collected and analyzed using the SPSS software under Mac OS Majave Version 10.14. Descriptive statistics will be done using mean and standard deviations, followed by inferential statistics using the Fisher's exact test, Chi-Square test, student t- test and paired t-test. Significance was adopted at $p < 0.05$ which will be used as a cutoff point to control for alpha error.

3.6. References

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13.	Koromantzios, P.A., et al., <i>A randomized, controlled trial on the effect of non-surgical periodontal therapy in patients with type 2 diabetes. Part I: effect on periodontal status and glycaemic control.</i> Journal of clinical periodontology, 2011. 38 (2): p. 142-147.
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16.	Correa, F.O., et al., <i>Effect of periodontal treatment on metabolic control, systemic inflammation and cytokines in patients with type 2 diabetes.</i> Journal of clinical periodontology, 2010. 37 (1): p. 53-58.
17.	Santos, V., et al., <i>Partial-and full-mouth scaling and root planing in type 2 diabetic subjects: a 12-mo follow-up of clinical parameters and levels of cytokines and osteoclastogenesis-related factors.</i> Journal of periodontal research, 2012. 47 (1): p. 45-54.

3.7. Project/ research management

This section includes a discussion on

<p>Ethical consideration (if applicable) (include confidential/ sensitive information or intellectual property information)</p>	<p>This study will be submitted for review to Taibah University College of Dentistry Research Ethics Committee (TUCDREC).</p>
<p>In the case of requesting a waiver of documentation of consent form; Please justify.</p>	<p>No waiving of documentation of informed consent form will be requested, a copy of the consent form is attached with this application</p>
<p>Potential Risk or problems & safety consideration</p>	<p>There is no risk to the patients and all collocated data will be anonymous.</p>

<p>Benefits of participating in the study</p>	<p>All patients in both groups will be received non-surgical periodontal therapy that will improve their periodontal status.</p> <p>The present study will support or contradict previous studies which have reported the relations between the periodontal therapy and the glyceemic control.</p>
<p>Project plan (including other required administrative approvals, fieldwork information, facilities, timeframe, cost & budget justification, resources, health & safety considerations)</p>	<p>The follow-up period in this study will be 3 months</p>

