

ORIGINAL RESEARCH

Comparative Evaluation of Homeopathic Therapy in the Treatment of Chronic Periodontitis

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ABSTRACT

Context and Objective • Periodontitis and type 2 diabetes (T2D) are chronic diseases generally treated with conventional therapies alone. The aim of this study was to compare the effects of homeopathy as an adjunct to conventional periodontal therapy in individuals with periodontitis and T2D.

Design • 85 individuals, age between 35 and 70 years, of both genders, participated in this randomized study; 70 patients were from the Institute of Endocrinology and Diabetes of Rio de Janeiro, Brazil. They were divided into 2 groups: G1, individuals with periodontitis without systemic conditions; and G-2, individuals with periodontitis and T2D. Both groups received homeopathic treatment and were evaluated in clinical and laboratory examinations. The medication used was chosen based on the similarity principle: *Berberis 6CH*, *Mercurius Solubilis/Belladonna / Hepar Sulfur* and a *Pyrogenium 200CH* biotherapeutic.

Medications were prescribed in diluted low ultra-diluted concentration doses for all signs and symptoms, while biotherapeutics were used for chronic stimulation.

Setting • The study was performed in Brazil by university research professors of homeopathy and periodontics.

Results • Both groups showed significant clinical and laboratory improvements during the study from baseline to 1 year with reductions in total cholesterol (total-C), triglycerides, glucose, glycated hemoglobin (A1cHb), uric acid and C-reactive protein (CRP). Statistical and descriptive analyses were performed. For most parameters, G1 performed better than G2 ($P < .05$).

Conclusion • Homeopathy as an adjunct to periodontal treatment improves local and systemic clinics and can provide better health conditions for patients with or without T2D. (*Altern Ther Health Med.* 2022;28(1):100-106)

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INTRODUCTION

Periodontal diseases are commonly referred to as inflammatory disorders known as gingivitis and periodontitis, and are caused by a pathogenic microbiota.¹ Periodontitis is an inflammatory, multifactorial irreversible disease of periodontal supporting tissues of the teeth. This infection is a result of the disruption of homeostasis between subgingival microbiota and host defenses.¹

As the inflammatory process continues, it extends to the periodontal tissues, bone and finally, teeth, causing tooth loss.¹⁻⁴ Personalized therapy can influence decision making regarding prevention, early diagnosis and treatment of oral diseases.⁵

The number of diseases and conditions that have been linked with periodontitis has increased exponentially in the past 2 decades, with particular focus on the effects of periodontal disease in 3 pathologic conditions: cardiovascular disease, diabetes, and adverse pregnancy outcomes.⁶

The demand for Integrative and Complementary Practices (ICPs) in the public health system has increased,

particularly in the treatment of chronic diseases. ICPs are especially useful when conventional medicine is unable to offer satisfactory results, or in the systemic context, when it only provides symptomatic relief.⁷

Diabetes is a chronic metabolic condition, characterized by hyperglycemia and metabolic disorder, which results in a defect in insulin secretion.⁸ It is estimated that by 2030 it will affect 439 million people, representing 7.7% of the total adult population between age 20 and 79 years. Prospective epidemiologic studies conducted in the United States and Europe have established that periodontitis is more prevalent in patients with than without diabetes. The severity of periodontitis may be associated with poor glycemic metabolic control and associated with metabolic syndrome, hypertension and dyslipidemia.^{8,9}

In dentistry, patients seeking ICPs expect treatment of critical conditions, such as toothache, tooth decay, temporomandibular disorders, periodontal disease and dry mouth.⁷ ICPs also have an important role in the treatment of anxiety, and according to the World Health Organization (WHO), homeopathy is one of the most frequently used therapies.^{10,11} Although it is not the first choice of dentists, clinical experience suggests it is effective, inexpensive, satisfactory for patients and has a low incidence of adverse events.^{10,11}

Homeopathy is a well-defined scientific system based on the “principle of similar” (*similia similibus curantur*), according to which a disease can be cured by the same symptoms produced in a healthy individual. It is a holistic approach to treatment, making it a natural choice in individuals chronic disease,¹²⁻¹⁴ including T2D.¹⁰

For these reasons, the aim of this study was to compare the effects of homeopathy as an adjunct to conventional periodontal therapy in individuals with periodontitis and T2D.

MATERIALS AND METHODS

This 1-year clinical trial was carried out after approval by the Ethics and Research Committee (Reference: 1.756.716) and was conducted from March to December, 2018. All individuals who participated in the study signed an Informed Consent Form.

Inclusion criteria. (a) patients with a confirmed diagnosis of T2D being treated at the State Institute of Diabetes and Endocrinology Luiz Capriglione (IEDE/RJ) and presenting with periodontitis, according to the new classification of periodontal and peri-implant diseases and conditions¹⁵; and (b) patients with periodontitis following the criteria for a periodontal probing depth (PPD) ≥ 4 mm, clinical attachment loss (CAL) ≥ 3 mm in at least 2 proximal sites of 2 non-adjacent teeth, radiographic bone loss and bleeding on probing (BOP).¹⁵

Exclusion criteria. Patients who (a) received periodontal treatment 12 months before the beginning of the study; (b) were smokers; (c) pregnant; (d) with a systemic condition that could affect periodontal tissues and response to treatment, such as HIV and (e) using medications such as anti-inflammatories and antibiotics in the prior 6 months.

Initially, 85 individuals of both genders between age 35 and 70 years were invited to participate. Based on the exclusion criteria, 70 eligible individuals were chosen and divided into 2 groups: Group 1 (G1) (n = 35), patients with periodontitis without systemic conditions and Group 2 (G2) (n = 35), patients with periodontitis and T2D.

Medical and dental anamnesis was conducted by an examiner via a questionnaire to identify possible risk factors, such as gender, age, blood pressure, heart disease, family history of diabetes, dyslipidemia, abdominal circumference, body mass index (BMI) and lifestyle (data not shown).

Clinical Parameters

All patients submitted to periodontal examination by a blinded periodontist (LCM) using a manual periodontal probe (PCPUNC, Hu-Friedy, Chicago, Illinois, USA). The clinical parameters used were PPD, CAL, visible plaque index (VPI) and BOP. All parameters were measured at 6 sites per tooth.

Examiner calibration was performed during a pilot study that preceded the present investigation. Six sites of all present teeth from 6 patients with periodontitis were examined twice with a week interval. The Interclass Correlation Coefficient should be >0.8 for all clinical parameters.

Treatment Protocol

All patients received non-surgical periodontal therapy (NSPT) from a periodontist (LCM), including oral hygiene instructions (tooth brushing and dental interdental plaque control) were reinforced after 3, 6 and 12 months. A brief description of periodontal disease, discussing its local and systemic effects, and supra and subgingival scraping and root planing.

All mechanical debridement was performed using Gracey curettes (Hu-Friedy, Chicago, IL, USA) and ultrasonic tips (Profi Neo, Dabi Atlante, Ribeirão Preto, SP, Brazil). The number of consultations was limited to 4, with 1 consultation per quadrant. The instrumentation time was maximum 10 minutes per tooth.

In order to avoid undesirable metabolic imbalances in individuals with T2D, precautions were taken during the procedure including checking capillary glycemia with a glucometer before, during and after the consultation; certification of the correct use of medicines; prioritizing short consultations, mid-morning; before starting treatment, a statement from the patient's endocrinologist was requested to clear the patient for treatment. All patients were instructed to perform correct oral hygiene and consume an adequate diet; oral tissues were manipulated for less time to promote a quick healing process and blood pressure was measured before and after consultations.

Homeopathic Therapy (HT)

After NSPT, all patients also received HT. The medication used by G1 and G2 was chosen based on the similarity

principle, following the *Berberis* 6CH protocol (2 tablets, 2 times a day for 45 days), *Mercurius Solubilis/Belladonna/Hepar Sulfur* - 6CH (2 tablets, 3 times a day for 15 days) and a *Pyrogenium* 200CH biotherapeutic (2 tablets, single weekly dose, for 2 weeks). Medications are prescribed in diluted low concentration doses for all signs and symptoms, while biotherapy was used for chronic stimulation.¹⁰

Blood Test Evaluation

All patients underwent laboratory tests, collected for comparison at 6 and 12 months after NSPT. The following parameters were evaluated: (a) low-density lipoprotein cholesterol (LDL-C), (b) high-density lipoprotein cholesterol (HDL-C), (c) total blood cholesterol (TOTAL-C), (d) triglycerides, (e) fast blood sugar level glucose, (f) uric acid and (g) C-reactive protein (CRP).

Data Analysis

Statistical software (Statistical Package for the Social Sciences 21.0; IBM, Armonk, NY, USA) was used for all statistical analysis. The normality of the quantitative variables was checked using the Kolmogorov-Smirnov test and graphic analysis. The continuous variables were described as mean (standard deviation [SD]), and categorical characteristics as frequency (n [%]). The difference between G1 (n = 33), periodontitis and healthy systemic conditions; and G2 (n = 35), periodontitis and T2D at baseline and 1-, 6- and 12-month follow-up for laboratory parameters (LDL-C, HD-CL, TOTAL-C, triglycerides, glucose, uric acid and CRP) and at baseline, 1-, 6- and 12-month follow-up for clinical parameters (VPI, BOP, CAL and PPD) was calculated using a general linear model for repeated measures adjusted by Bonferroni’s post hoc test. For intragroup analysis, a general linear model for repeated measures adjusted by Bonferroni’s *post hoc* test was also used. The statistical significance level was set at 5% ($P < .05$).

A sample size of 35 patients for each group was determined, based on a former study,¹⁰ to have 95% power to detect the expected reduction in mean CAL, considered the primary end point, from 5.2 mm to 4.5 mm after NSPT, with an SD of 0.8 mm.

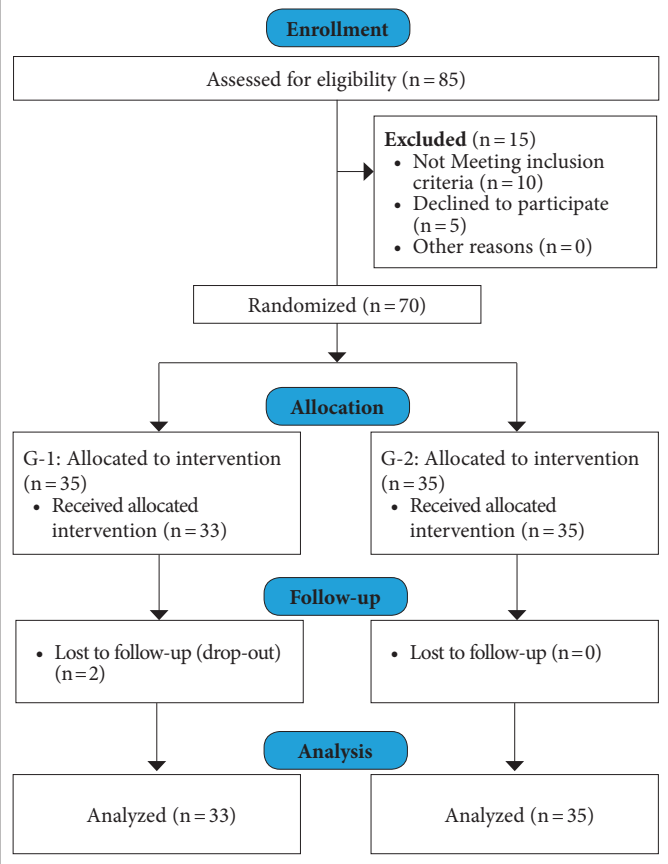
RESULTS

A total of 70 patients were initially selected for the study. Of these, 68 completed the 1-year follow-up (see Figure). Drop out (n = 2, secondary to appointment times that conflicted with work) was only observed in G1 (see Figure) and did not compromise the results.

Age, gender, number of teeth, VPI, BOP and CAL of individuals were equivalent in both groups with no statistically significant difference, as shown in Table 1. However, G2 presented significantly deeper pockets than G1 ($P = .011$) (see Table 1).

Periodontal treatment resulted in significant improvement in the clinical parameters in G1 and G2; a significant improvement was observed after 30 days and

Figure 1. Study patient flow chart.



6 months of treatment in the VPI in both groups. Intergroup comparison showed lower plaque in G2 after treatment in all periods evaluated (see Table 2).

After 30 days of conventional periodontal therapy, BOP was decreased by approximately 50% in both groups, and remained low after 12 months of treatment (approximately 10% of sites). There was no significant difference in the observed periods between groups ($P > .05$) (see Table 2).

There was no difference in CAL between groups in any analyzed period. However, an attachment gain was observed in both G1 and G2 at the 12-month follow-up of +0.91 mm and +0.61 mm, respectively (see Table 2).

PPD was also improved in both groups, resulting in a decrease in G1 from 5.12 to 4.59 (-0.53mm) and in G2 from 5.39 to 4.46 (-0.93mm). Comparing groups, patients with systemic involvement had a more favorable pocket reduction after 12 months of treatment ($P = .020$) (see Table 2).

There was also an improvement in systemic parameters in both groups that showed a reduction in all parameters after 6 and/or 12 months, except in HDL-C in G1 and G2 and triglycerides in G1. Furthermore, uric acid levels returned to baseline in both groups at 12-month follow-up (see Table 3). However, despite the systemic condition, it is important to note relevant improvements in G2 in glucose and CRP (see Table 3). Between-group comparisons showed that triglycerides (at 12 months) and glucose (for all periods) were lower in G1 than G2 ($P < .05$) (see Table 3).

Table 1. Study Patient Demographics

Parameters	G1 (n = 33)	G2 (n = 35)	P Value
Age, mean (SD)	49.6 (8.5)	49.4 (8.6)	.260
Gender M/W	15/20	15/19	.220
Number of Teeth, mean (SD)	21.6 (4.4)	23.5 (3.7)	.240
% BOP, mean (SD)	51.8 (13.5)	52.1 (13.5)	.936
% VPI, mean (SD)	77.3 (8.1)	74.5 (9.9)	.193
CAL mm, mean (SD)	5.2 (0.7)	5.2 (0.5)	.082
PPD mm, mean (SD)	5.1 (0.4)	5.4 (0.4)	.011 ^a

^aStatistically significant.

Abbreviations: BOP, bleeding on probing; CAL, clinical attachment loss; M/W, men/women; PPD, periodontal probing depth; SD, standard deviation; VPI, visible plaque index.

Table 2. Study Clinical Parameters (Baseline and 1, 6 and 12 Months)

Clinical parameters	G1 (n = 33)	G2 (n = 35)	P Value
VPI (%)			
baseline	77.34 (8.13)	74.49 (9.96)	.193
1 month	55.26 (14.51)	37.63 (8.56)	<.001
6 months	43.60 (7.82)	30.57 (7.83)	<.001
12 months	58.86 (13.77)	45.40 (15.57)	<.001
BOP (%)			
baseline	51.85 (13.59)	52.11 (13.59)	.936
1 month	25.13 (8.36)	25.69 (8.01)	.917
6 months	9.39 (6.08)	10.99 (6.72)	.299
12 months	10.41 (5.51)	12.92 (6.83)	.095
CAL (mm)			
baseline	5.27 (0.70)	5.28 (0.47)	.082
1 month	4.32 (0.14)	4.37 (0.21)	.135
6 months	4.42 (0.26)	4.52 (0.30)	.284
12 months	4.36(0.25)	4.57 (0.24)	.112
PPD (mm)			
baseline	5.12 (0.44)	5.39 (0.42)	.011
1 month	4.32 (0.28)	4.34 (0.18)	.701
6 months	4.44 (0.31)	4.42 (0.13)	.704
12 months	4.59 (0.29)	4.46 (0.12)	.020

Note: Intergroup analysis (lines) *P* value adjusted for multiple comparisons by the Bonferroni test.

Abbreviations: BOP, bleeding on probing; CAL, clinical attachment loss; G1, Group 1 (periodontitis + healthy systemic condition); G2, Group 2 (periodontitis + type 2 diabetes); PPD, periodontal probing depth; VPI, visible plaque index.

Table 3. Study Laboratory Parameters (Baseline, 6months, and 12 months)

Systemic Parameters	G1 (n = 33)	G2 (n = 35)	P Value
LDL-C (mg/dL)			
baseline	146.15 (63.39)	137.20 (32.16)	.462
6 months	137.30 (42.06)	130.11 (28.16)	.408
12 months	122.09 (40.16)	135.49 (30.74)	.126
HDL-C (mg/dL)			
baseline	48.70 (9.68)	49.54 (12.15)	.753
6 months	52.61 (7.43)	50.80 (9.01)	.373
12 months	51.24 (7.35)	49.23 (8.57)	.304
Total-C (mg/dL)			
baseline	212.24 (67.76)	206.57 (39.61)	.673
6 months	189.14 (32.62)	183.97 (28.64)	.490
12 months	188.79 (47.72)	188.71 (28.62)	.994
Triglycerides (mg/dL)			
baseline	141.27 (68.23)	151.57 (49.46)	.477
6 months	127.82 (53.14)	131.74 (40.26)	.732
12 months	112.15 (44.63)	135.94 (40.41)	.024
Glucose (mg/dL)			
baseline	99.97 (9.60)	135.83 (35.22)	<.001
6 months	91.91 (6.67)	108.40 (28.09)	.002
12 months	89.61 (4.93)	109.23 (23.96)	<.001
Uric acid (mg/dL)			
baseline	5.64 (1.64)	5.58 (1.50)	.874
6 months	4.94 (1.10)	5.02 (1.16)	.754
12 months	5.00 (1.12)	5.34 (1.44)	.289
CRP (mg/dL)			
baseline	2.07 (0.74)	1.91 (0.56)	.310
6 months	1.43 (0.71)	1.28 (0.60)	.334
12 months	1.56 (0.66)	1.42 (0.53)	.337

Note: Intergroup analysis (lines) *P* value adjusted for multiple comparisons by the Bonferroni test.

Abbreviations: CRP, C-reactive protein; G1, Group 1 (periodontitis + healthy systemic condition); G2, Group 2 (periodontitis + type 2 diabetes); LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; TOTAL-C, total blood cholesterol.

DISCUSSION

The aim of this study was to compare the effects of homeopathy associated with conventional periodontal therapy to improve clinical and laboratory parameters in patients with periodontitis associated or not associated with T2D for 12 months.

After NSPT+HT therapy, there was a reduction in clinical parameters in both groups, ranging from 24% to 39% (VPI), 75% to 80% (BOP), 0.53 to 0.93 mm (PPD) and 0.71 to 0.91 mm (CAL), better than former studies without homeopathy.^{10,13,14} Individuals with T2D showed similar reductions in values to healthy individuals, demonstrating the importance of conventional periodontal therapy plus homeopathic treatment in restoring periodontal health. However, although all patients received instructions on oral hygiene, which could explain biofilm and BOP reduction in both groups, G1 and G2 showed an increase in plaque formation after 12 months, which reinforces the need for regular reinforcement of biofilm control.¹⁶ Moreover, adults with T2D are at great risk of developing depression, which can also impair routine oral hygiene.¹⁷ However, it is important to note that G2 showed a greater reduction in PPD than G1. Although T2D negatively influenced the host response,¹⁸ deep sites at baseline, as observed in G2, tend to show greater reductions after therapy.¹⁶

There was also an improvement in systemic parameters in both groups. Despite G2 systemic condition, it is important to note relevant improvements in glucose and CRP levels after homeopathy therapy. However, as expected, glucose levels were lower in G1 than in G2.

Dyslipidemia is often associated with patients with T2D, characterized by increased triglycerides and LDL-C, and significantly correlated with insulin resistance.^{9,19} Also, stress and anxiety levels can increase cholesterol, uric acid and triglyceride levels.¹⁴ There was a significant reduction in total cholesterol in G2. Furthermore, both G1 and G2 showed levels <200 mg/dL, indicating that the treatment seems to be effective in maintaining acceptable levels of this parameter.²⁰ Only G1 showed a significant improvement in LDL-C, maintaining a level of >130 mg/dL²¹ at 12-month follow-up. G1 also showed a significant improvement in triglyceride levels compared with G2 at 12 months, but both groups presented triglyceride levels <150 mg/dL, the value recommended by the American Heart Association to improve heart health.²²

Glucose levels were improved in both groups. At 12-month follow-up, both G1 and G2 presented a blood glucose level <130 mg/dL,²³ showing the effectiveness of periodontal treatment associated with homeopathy for glycemic control in patients with diabetes.²⁴ There is strong evidence that periodontitis negatively affects glycemic control in patients with diabetes.¹ Therefore, homeopathy seems to be a good alternative for controlling patients' blood glucose levels.

The normal concentration range of uric acid is 2.5 to 7 mg/dL for men and 1.5 to 6 mg/dL for women. Both groups had normal values (approximately 5) at the 12-month follow-up.²⁵

Finally, there was a positive response in both groups in CRP levels. Elevated CRP acts as a biomarker for oxidative stress in cells, and a reduction in CRP could be considered a good indicator of the success of periodontal treatment in patients with T2D.²⁶

In addition to several etiologic factors, the pathophysiology of T2D is due to the dysfunction of beta-pancreatic cells, leading to a high level of glucose in the blood, and ultimately stimulating insulin secretion. Excess insulin is produced and beta cells become dysfunctional. This deregulation may compromise the function of the pancreas and contribute to the development of chronic diseases.^{27,28}

The homeopathic therapy used in this study was focused on treating the individual as a whole. Many studies have shown positive results with a combination of homeopathic medications, such as *Berberis vulgaris* (*B vulgaris*), *Mercurius solubilis* (*M solubilis*), *Hepar sulfur* (*H sulfur*) and *pyrogenium*.^{10,13,14}

B vulgaris is traditionally used in ancient medical disciplines, such as Indian and Chinese medicine. Phytochemical analysis of the root shows the presence of alkaloids (berbamine, tetrandrine and chondocurine), with anti-inflammatory medicinal properties and immunosuppressive activity, in addition to having antioxidant and antimicrobial activity in more than 54 species of bacteria.²⁹ According to Abd El-Wahab, et al,²⁹ the greatest use of this plant over the years was for gastrointestinal disorders, bile stimulation and bilirubin secretion. Being a hepatorenal draining medication, it may have contributed to the self-regulation of cells, decreasing glucose levels. Such anti-inflammatory properties could explain the decreased levels of CRP seen in both groups.

In studies carried out by Vasavan Jyothilakshmi, et al,³⁰ a decrease in the urolithiasis inhibitor magnesium in urine was prevented by treatment with *B vulgaris*, and creatinine levels were largely normalized. Hyperoxaluria-induced renal damage was evident from the decreased activities of tissue marker enzymes and an apparent escalation in their activity in the urine in study control animals; this was prevented by *B vulgaris* treatment.³⁰

M solubilis is prepared using mercury salt. It is used in homeopathy to treat infections and suppurative processes. In medicine, the derivative is used as an antiseptic and vaccine, and may increase immunologic factors via cytokine secretion. *M solubilis* has the ability to modulate the immune system through macrophages present in acute and chronic processes.^{31,32}

H sulfur is used in acute periodontal lesions, especially in periodontal abscesses. As shown in a study with 30 patients, the pain ranged from intense or moderate to light within 72 hours.^{33,34} The medication is used for self-regulation and mental balance, together with *B vulgaris*, *M solubilis* and Bell.

Pyrogenium is an excellent biotherapeutic agent for serious infections. It stimulates autopoiesis and, therefore, activates T cell-mediated immunoregulatory activity and pro-inflammatory cytokines to fight infections.^{35,36}

This study was conducted to understand the mechanism of action of homeopathic medication and to prove its effectiveness in treating periodontal disease in patients with or without systemic impairment. There is an important amount of scientific evidence regarding homeopathic therapeutic potential. Following a randomized triple-blind placebo-controlled study,³⁷ a Brazilian clinical trial that involved 600 children from the Public Health System showed that the placebo group came up with a 3-times higher number of flu and acute respiratory infection symptoms compared with children treated with homeopathic medicine. These differences are due to the immunomodulatory effects triggered by homeopathic medicine, and those effects were also observed by other investigators.^{35,36,38} The homeopathic manufacturing process involves several cycles of dilution and agitation that can modify the physical-chemical properties of dynamized homeopathic medicines.³⁹⁻⁴¹ In addition, by using proton nuclear magnetic resonance, studies showed that the generation of supramolecular structures, called micro and nanobubbles, could be derived from the dynamization process.^{42,43} These nanobubbles—containing water, ions and chemical constituents of solute—might be involved with the homeopathic solution identity.

In general, these problems are part of the physical-chemical structure and function of the human body, and homeopathy has proven several times that it can help fix them.⁴⁴ According to Luc Montagnier, who won the Nobel Prize for Medicine in 2008 for co-discovering the acquired immunodeficiency virus (HIV) that causes AIDS, "There is a scientific basis in homeopathy, but it is ignored. It is a problem of science that silences everything that can disturb the economy."⁴⁴

The results of this study suggest that the association of homeopathy with conventional periodontal therapy improves the clinical and systemic parameters of patients with periodontitis. Patients who have T2D can benefit from homeopathic therapy for glycemic control and thus improve their quality of life. These results prove once again that homeopathy is effective in adding value to conventional therapies and reducing the demand for allopathic medicines.

CONCLUSION

Homeopathic therapy, as an adjunct to periodontal treatment, improves local and systemic parameters and can provide better health in patients with T2D.

Future investigation is needed with a multidisciplinary evaluation to improve the quality of life of patients with chronic and systemic periodontitis.

Study Limitations

The study limitations are the commitment of the individuals evaluated to seek care by a homeopathic dentist.

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CONFLICT OF INTEREST

None.

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