Content available at: https://www.ipinnovative.com/open-access-journals

Journal of Dental Specialities

Journal homepage: https://www.jdsits.in/

Original Research Article

Clinical evaluation of topical application of anti-oxidant coenzyme Q10 on periodontal status in diabetic patients- Randomized control trial

Snehal Chintale[1]*, Prashanth Vishwakarma[1], Ashwini S Zadode[2], Divya Ghune[1], Sujata Chhabile[1], Saloni Wankhede[1]

[1]Dept. of Public Health Dentistry, JMF's ACPM Dental College, Dhule, Maharashtra, India
[2]Dept. of Periodontology, JMF's ACPM Dental College, Dhule, Maharashtra, India

Abstract

Introduction: Gingivitis and periodontitis are linked to the excessive production of oxygen species and some free radicals), which can contribute to tissue destruction. Coenzyme Q10 (CoQ10), a powerful natural antioxidant, exists in two forms: the oxidized form and the reduced form. It functions as a ROS scavenger and may help reduce periodontal inflammation.
Aim: To assess and compare the therapeutic efficacy of topical Coenzyme Q10 application versus conventional scaling and root planing alone in enhancing periodontal health, as measured by changes in the Gingival Index and the Community Periodontal Index of Treatment Needs (CPITN) at baseline, 3 weeks, and 6 weeks.
Materials and Methods: A total of 32 diabetic patients divided into 2 groups. One group is exposed to topical application (extrasulcular) Coenzyme Q10 & SRP and 2nd group is exposed to SRP only. Clinical parameters, including the Gingival Index and CPITN index, were evaluated at baseline, at the end of the 3rd week, and at the 6th week.
Results: Intra-group comparison was done both the indices gingival index (GI), Community periodontal index of treatment needs(CPITN) showed significant reduction in the scores but the results where statistically non-significant in all 2 treatment groups.
Conclusion: Antioxidant is effective in reducing the gingival inflammation among diabetic patients.

Keywords: Antioxidants, Periodontitis, Coenzyme Q10, Gingivitis, Topical application

Received: 07-01-2025; **Accepted:** 13-09-2025; **Available Online**: 29-09-2025

1. Introduction

Gingival and Periodontal inflammation are infectious oral inflammatory Conditions. Gingivitis is a reversible inflammation of the marginal gingiva caused by plaque accumulation, whereas periodontitis is a progressive, irreversible condition characterized by the destruction of connective tissue attachment and supporting bone, eventually leading to tooth loss.[1]

Periodontal diseases are one of the most important disease. Periodontitis is the condition of inflammatory response of periodontal tissues to plaque and accumulation of this leads to microorganisms that can cause damages to tissue organ & disease progression leads to increase pocket depth, reduces supporting tissues of the teeth.[2,3] Most Common indicators which are used for measuring periodontitis currently includes pocket depth, bleeding on probing, clinical attachment loss and plaque index, but no laboratory tests are currently available to determine patients with periodontitis that are not routinely treated.[3,4]

In India, Persons more than 30 years of age are screened for common Non communicable diseases. As per Indian Council of Medical Research – India Diabetes (ICMR INDIAB) study published in 2023, the prevalence of diabetes is 10.1 crores. Distruction of tooth supporting structure and

*Corresponding author: Snehal Chintale
Email: sbchintale@gmail.com

https://doi.org/10.18231/j.jds.9679.1405469647

teeth loosening are the most important complications of this disease.[4]

Multiple studies have demonstrated that periodontitis results from immune response products triggered by microbial plaque accumulation along the gingival margin. Polymorphonuclear leukocytes, while serving as key mediators of the host defence, may also play a role in periodontal tissue damage by releasing proteolytic enzymes and reactive oxygen species (ROS).

CoQ10 has been found to regulate the expression of over 100 genes involved in cellular metabolism, and some literatures in diabetic animal models have demonstrated its ability to influence key components of the insulin signaling pathway, including insulin receptors, tyrosine kinase, and phosphatidylinositol kinase.[9,10] Antioxidants are compounds that, even at low concentrations relative to oxidizable substrates, can significantly delay or prevent the oxidation of those substrates. Coenzyme Q10 (CoQ10) acts as an antioxidant and is present in both its oxidized form and reduced form. Battino et al. highlighted the importance of CoQ10 as a crucial antioxidant in neurodegenerative diseases driven by free radicals. Furthermore, Littarru and Henson identified a deficiency of CoQ10 in the gingival tissues of individuals with periodontitis.

Figure 1: Coenzyme Q10 capsule

Figure 2: Gingival bleeding at baseline

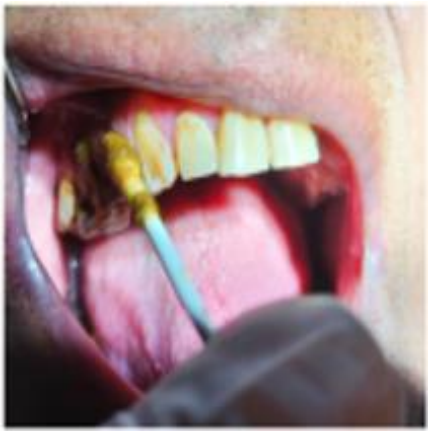

Figure 3: Topical application of CoQ10

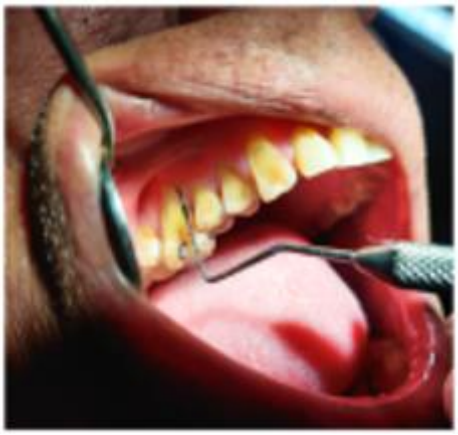

Figure 4: Gingival bleeding at 6 weeks

CoQ10, 120 mg is a fat-soluble compound that supports Heart Health, Antioxidants, and Anti-Aging.[16,17] It includes Co-enzyme Q10, plays a vital role in a number of reactions in the body & also produces energy for the functioning of all important body organs. This supplement helps to prevent cells damage. The novel formulation packed in nutraceutical capsules for easy consumption.[17,18] The dietary supplement works faster and fulfills all critical food safety-related aspects. It also includes Piperine + Bio Perine. It may help in controlling the formation of blood clots by boosting immunity.(**Figure 1-4**) However, there is currently limited evidence from interventional studies in humans to support the clinical therapeutic benefits of CoQ10 in periodontitis. CoQ10 acts mainly as an antioxidant and supports mitochondrial function in non-diabetic periodontitis. In diabetes, where oxidative stress, AGE formation, and impaired insulin signaling aggravate periodontal damage, CoQ10 may additionally modulate insulin pathways and reduce AGE-related injury, offering greater therapeutic potential. Therefore, the present study aimed to evaluate the effectiveness of topically applied Coenzyme Q10 as an adjunct to mechanical periodontal therapy in patients with diabetes.

2. Materials and Methods

2.1. Study design

A randomized, double-blind, controlled clinical trial with a parallel group design was conducted in the Department of Periodontology at the institutional dental college. The study aimed to evaluate the adjunctive efficacy of topically applied Coenzyme Q10 (CoQ10) in patients with periodontitis and type 2 diabetes mellitus.

2.2. Ethical approval

The study protocol was approved by the Institutional Ethics Committee prior to commencement (Approval No.: /EC/NEW/INST/2022/2959/2022/049). Written informed consent was obtained from all participants before enrollment in the study, in accordance with the ethical standards of the institutional and national research committee.

2.3. Study population

A total of 32 patients diagnosed with type 2 diabetes mellitus were selected from the outpatient department of periodontology. The participants were aged 35 years or older, and all were non-smokers. The sample size was determined in advance from an interventional study by Thomas et al.[20] using an independent t-test. The sample size produced was 28 in both groups and increased by 20% to 32 (16 per group) to compensate for drop-outs and participants were randomly divided into two equal groups (n = 16 per group). After all the subjects have been identified they were assigned into blocks (Co-variates), then simple randomization was performed within each block to assign subjects to one of the treatment groups using a random number table by the statistician.

2.4. Inclusion criteria

Participants were included based on the following criteria:

1. Age ≥ 35 years
2. Diagnosed case of type 2 diabetes mellitus
3. Non-smoker
4. Systemically stable without any medical complications
5. Gingival Index (Löe and Silness, 1963) score of ≥ 2
6. Presence of at least three non-adjacent interproximal sites with probing pocket depth (PPD) ≥ 5 mm

2.5. Exclusion criteria

The following exclusion criteria were applied:

1. Use of antibiotics or anti-inflammatory drugs within the past 3 months
2. Pregnant or lactating women
3. Current smokers or history of tobacco use
4. Presence of missing teeth in target areas
5. Use of chemotherapeutic mouth rinses during the study period

2.6. Group allocation and interventions

Participants were randomly allocated into two groups:

1. Group A (Test Group): Received full-mouth scaling and root planing (SRP) followed by the topical application of Perio-Q (Coenzyme Q10) capsule at specified periodontal sites. Topical application was used with the tip of the applicator (Q tip) completely soaked in mixture and applied to the assigned quadrant experimental group
2. Group B (Control Group): Received full-mouth scaling and root planing (SRP) alone without any adjunctive CoQ10 application.

Both groups underwent mechanical debridement during their initial visit. Oral hygiene instructions were reinforced, including demonstration of proper brushing technique and recommendation to use a standard toothbrush and fluoridated toothpaste twice daily for the duration of the study.

2.7. Clinical parameters and outcome measures

1. The following clinical parameters were recorded to assess treatment outcomes:
   a. Gingival Index (GI) – to assess gingival inflammation
   b. Community Periodontal Index of Treatment Needs (CPITN) – to evaluate periodontal treatment requirements
2. Measurements were recorded at three time intervals:
   a. Baseline (Week 0)
   b. 3 weeks
   c. 6 weeks

All clinical recordings were performed by a single calibrated examiner blinded to the group allocation to reduce measurement bias.

2.8. Follow-up and patient instructions

Participants were instructed to report to the department weekly for three months for reinforcement of oral hygiene practices. They were specifically advised to refrain from using any mouthwashes, medicated rinses, or additional periodontal therapies during the study period to eliminate potential confounding variables.

3. Results

The clinical parameters such as gingival bleeding and periodontal pocket were significantly lower in cases then controls. Comparing gingival index, CPITN Index among two groups at end of 3rd and 6th week showed. Statistically significant results.

Table 1: Comparison of the change in CPITN index within each group n(%)

Group	CPITN Score	0 weeks	3 weeks	6 weeks	p-value
Control	Score 0	0	0	0	<0.001*
	Score 1	3 (13.3)	5 (26.7)	9 (53.3)	
	Score 2	4 (26.7)	9 (60)	7 (46.7)	
	Score 3	6 (40%)	2 (13.3)	0	
	Score 4	3 (20%)	0	0	
	Mean ± SD	2.67 ± 0.98	1.87 ± 0.64	1.47 ± 0.52	
Cases	Score 0	0	0	13 (70.6)	<0.001*
	Score 1	1 (5.9)	3 (29.4)	3 (29.4)	
	Score 2	3 (29.4)	12 (64.7)	0	
	Score 3	9 (47.1)	1 (5.9)	0	
	Score 4	3 (17.6)	0	0	
	Mean ± SD	2.77 ± 0.83	1.77 ± 0.56	0.29 ± 0.47	

Friedman 2-way ANOVA by rank test; * indicates a significant difference at p≤0.05

Table 2: Post hoc pairwise comparison of the change in CPITN index within each group

Pair	Control group (p-value)	Cases (p-value)
0 weeks vs 3 weeks	0.053	0.030*
0 weeks vs 6 weeks	0.001*	<0.001*
3 weeks vs 6 weeks	0.604	0.006*

Post hoc Bonferroni correction; * indicates a significant difference at p≤0.05

Table 3: Comparison of the change in gingival index within each group

Group	0 weeks	3 weeks	6 weeks	p-value
Control	2.00 ± 0.66	1.67 ± 0.62	0.80 ± 0.68	<0.001*
Cases	2.24 ± 0.75	1.06 ± 0.56	0.18 ± 0.39	<0.001*

Repeated measures one-way analysis of variance test; * indicates a significant difference at p≤0.05

Table 4: Post hoc pairwise comparison of the change in gingival index within each group

Pair	(Control group (p-value)	Cases (p-value)
0 weeks vs 3 weeks	0.058	<0.001*
0 weeks vs 6 weeks	<0.001*	<0.001*
3 weeks vs 6 weeks	<0.001*	<0.001*

Post hoc Bonferroni correction; * indicates a significant difference at p≤0.05

Table 5: Intergroup comparison of the CPITN index among both groups

Group	CPITN Score	0 weeks	3 weeks	6 weeks
Control	Score 0	0	0	0
	Score 1	2 (13.3)	4 (26.7)	8 (53.3)
	Score 2	4 (26.7)	9 (60)	7 (46.7)
	Score 3	6 (40%)	2 (13.3)	0
	Score 4	3 (20%)	0	0
Cases	Score 0	0	0	12 (70.6)
	Score 1	1 (5.9)	2 (29.4)	3 (29.4)
	Score 2	4 (29.4)	12 (64.7)	0
	Score 3	7 (47.1)	1 (5.9)	0
	Score 4	3 (17.6)	0	0
p-value	--	0.810	0.659	<0.001*

Mann Whitney test; * indicates a significant difference at p≤0.05

Table 6: Comparison of the gingival index among two groups

Interval	Control	Cases	p-value
0 weeks	2.00 ± 0.66	2.24 ± 0.75	0.356
3 weeks	1.67 ± 0.62	1.06 ± 0.56	0.006*
6 weeks	0.80 ± 0.68	0.18 ± 0.39	0.005*

Mann Whitney test; * indicates a significant difference at p≤0.05

Table 7: Assessment of the effect of the interaction of time and different treatments on CPITN and Gingival index score

Source	CPITN	GI
Treatment	F = 5.565 p = 0.033*	F = 2.917 p = 0.110
Time	F = 79.217 p <0.001*	F = 97.774 p <0.001*
Treatment * Time	F = 19.304 p <0.001*	F = 9.333 p = 0.001*

Univariate analysis (two-way analysis of variance); * indicates a significant difference at p≤0.05

This table compares the change in CPITN index scores within each group. A significant improvement in the CPITN index score was observed within each group from 0 to 6 weeks.(**Table 1**)

Post hoc pairwise comparison of the change in CPITN index score within each group showed. There was no change in the CPITN score between 0 and 3 weeks in the control group; however, a significant improvement in the CPITN score was observed in the control group from 0 to 6 weeks. In the cases group, improvement in CPITN score from 0 weeks to 3 weeks and from 0 weeks to 6 weeks was significant.(**Table 2**)

This table illustrates the change in Gingival Index scores within each group. A significant reduction in the Gingival Index score was observed within each group from 0 to 6 weeks.(**Table 3**)

Post hoc pairwise comparisons of changes in Gingival Index scores within each group showed no significant difference between the 0-week and 3-week scores in the control group. However, a significant reduction in the Gingival Index score was noted in the control group between 0 and 6 weeks. In the cases group, the reduction in the Gingival Index score was significant both from 0 weeks to 3 weeks and from 0 weeks to 6 weeks.(**Table 4**)

Intergroup comparison of the CPITN index score among the two groups showed a non-significant difference in the CPITN score at 0 and after 3 weeks. However, after 6 weeks, the difference in CPITN scores of the two groups was statistically significant with 12 subjects in the cases group showing healthy periodontal tissue at the end of 6 weeks compared to no subject in the control groups.(**Table 5**)

Intergroup comparison of the gingival index score among the two groups showed a non-significant difference in the gingival score at 0 weeks. After 3 and 6 weeks, the difference in gingival index scores of the two groups was statistically significant with the cases showing lower gingival index scores than controls.(**Table 6**)

Evaluation of the interaction between time and treatment type on CPITN and Gingival Index scores revealed that the type of treatment had a significant impact on CPITN scores, but not on Gingival Index scores. Additionally, the different time intervals significantly influenced both CPITN and Gingival Index scores. The effect of the interaction of time and different treatments on CPITN and Gingival index score was statistically significant.(**Table 7**)

4. Discussion

The use of antioxidant therapy for managing various diseases, including inflammatory periodontal disease, is well-documented in the literature.[19] Coenzyme Q10 (CoQ10), owing to its diverse biological roles, has attracted considerable research attention in recent years. However, recent developments concerning its application in the treatment of periodontal diseases remain limited.[7-9] Given the known benefits of CoQ10 and the prevalence of periodontal conditions among diabetic patients, we conducted a randomized, single-blind, controlled clinical trial. In this study, the experimental group received topical Coenzyme Q10 in addition to scaling and root planing, while the control group received scaling and root planing alone.

During the study, patients gave highly positive results in feeling of improvement of periodontium condition in experimental group than the control, thus confirmed the effectiveness of applied supporting therapy. No adverse reactions were seen in the study.

Table 1 shows comparision of change of CPITN scores within each group. It was seen that CPITN score in cases reduced from score 4 to score 0 during each follow up. Maximum participants in the cases group showed 0 score indicating the effectiveness of our study product.

In **Table 2** When CPITN scores were compared between both groups at 0 and 3 weeks, statistically significant results were observed. However, when baseline scores were compared with those at 6 weeks in both groups, a significant difference was noted, indicating a reduction in the CPITN index.

Table 3 shows that both the case and control groups experienced a significant reduction in Gingival Index scores, indicating that the application of Coenzyme Q10 was as effective as scaling and root planing.

In **Table 4**, When intraduration comparison was done it was seen that among cases the gingivitis status was improved from 0 weeks to 6 weeks showing that statistical significance difference.

Topical (extrasulcular) application of supplements alone (experimental group) resulted in significant reduction ($P<0.01$) of gingival index score within each group from 0 weeks to 6 weeks. Intergroup comparison of Gingival Index scores showed no significant difference between the two groups at baseline (0 weeks). However, at 3 and 6 weeks, the difference became statistically significant, with the case group exhibiting lower Gingival Index scores than the control group. When comparing the change in CPITN index scores within each group, a significant improvement was observed in the CPITN index from 0 weeks to 6 weeks in both groups. The greater benefits seen in diabetics may be due to CoQ10's dual action—antioxidant effects plus modulation of insulin signaling and AGE-related damage—making its impact more pronounced than in non-diabetic periodontitis.

Results were similar to Matthews Brzozowska et al. 2007 suggesting that the gel could be a treatment option for gingivitis cases and also is a convenient method for patients for home use but in this present study instead of gel we used coenzyme Q10 in capsule form which showed much effective in diabetic patients.[5]

In the study conducted by Hans et al., comparing scaling and root planing alone with CoQ10 gel, no statistically significant difference was observed. However, in our study, Coenzyme Q10 capsules proved more effective in reducing gingivitis and periodontitis than scaling and root planing alone.[1] A clinically significant improvement was observed in diabetic patients following the topical application of Coenzyme Q10 supplements alongside scaling and root planing. However, our results differ, likely due to differences in formulation (capsule-based topical application vs. gel), study population (diabetic patients in our study who are more prone to oxidative stress), and follow-up duration. These factors may explain why our trial demonstrated greater clinical improvements with CoQ10 as an adjunct to SRP.

5. Strength of the Study

This randomized controlled trial involved diabetic patients with moderate to moderately severe periodontal disease. The Coenzyme Q10 formulation used in the study demonstrated effectiveness when combined with scaling and root planing in treating gingivitis and periodontitis. It is recommended to be used judiciously after further studies involving larger populations.

6. Limitations

The present study has certain limitations. The relatively small sample size and short follow-up period of six weeks may restrict the generalizability and long-term applicability of the findings. Being a single-center trial, selection bias cannot be excluded, and the results may not reflect outcomes in broader populations. Only clinical parameters such as Gingival Index and CPITN were assessed, while more comprehensive measures like clinical attachment level, bleeding on probing, radiographic changes, and biochemical markers of oxidative stress were not evaluated. Furthermore, the study included only non-smoking diabetic patients, which may limit applicability to other groups such as smokers, non-diabetics, or patients with systemic complications. Lastly, as the trial used a specific topical CoQ10 formulation, the results may not be directly comparable with other delivery systems such as gels, systemic supplements, or injectable forms.

7. Future Vistas

Further studies with larger sample sizes and longer follow-up are needed to confirm these results. Comparative trials in diabetic and non-diabetic patients, exploration of advanced delivery systems, biomarker-based assessments, and evaluation of effects on glycemic control could provide deeper insights into the role of CoQ10 in periodontal therapy. Importantly, evaluating the impact of adjunctive CoQ10 therapy on systemic diabetic markers such as HbA1c would strengthen its clinical relevance by linking periodontal improvements with better glycemic control.

8. Conclusion

According to results of present study, it has been seen that the Coenzyme Q10 is effective in diabetic patients to improve their periodontal health & it was found that Coenzyme Q10 was found to be a valuable adjunct to scaling and root planing. Both treatments—scaling and root planing alone and in combination with topical CoQ10—produced statistically significant improvements. Short-term results confirmed the primary role of scaling and root planing, with CoQ10 enhancing clinical outcomes. These findings offer strong clinical support for the adjunctive use of CoQ10 capsules in periodontal therapy.

9. Source of Funding

None.

10. Conflict of Interest

None.

References

1. Hans M, Prakash S, Gupta S. Clinical evaluation of topical application of perio-Q gel (Coenzyme Q(10)) in chronic periodontitis patients. *J Indian Soc Periodontol*. 2012;16(2):193–9.
2. Badmaev V, Majeed M, Prakash L. Piperine derived from black pepper increases the plasma levels of coenzyme Q10 following oral supplementation. *J Nutr Biochem*. 2000;11(2):109–13.
3. Manthena S, Rao MV, Penubolu LP, Putcha M, Harsha AV. Effectiveness of CoQ10 Oral Supplements as an Adjunct to Scaling and Root Planing in Improving Periodontal Health. *J Clin Diagn Res*. 2015;9(8):ZC26–8.
4. Raut CP, Sethi KS. Comparative evaluation of co-enzyme Q10 and Melaleuca alternifolia as antioxidant gels in treatment of chronic periodontitis: A clinical study. *Contemp Clin Dent*. 2016;7(3):377–81.
5. Matthews-Brzozowska T, Kurhañska-Flisykowska A, Wyganowska-OEwi¹tkowska M, Stopa J. Healing of periodontal

tissue assisted by Coenzyme Q10 with Vitamin E – clinical and laboratory evaluation. *Pharmacol Rep*. 2007;59(Suppl 1):257–60.
6. Ghasemi S, Torab Z, Shirmohammadi A, Babaloo A, Johari R, Farhadi F, et al. Evaluation of the effect of coenzyme Q10 supplementation along with scaling and root planing (SRP) on periodontal and gingival indices in controlled diabetic patients. *J Adv Periodontol Implant Dent*. 2022;14(1):32–7.
7. Altman LC, Baker C, Fleckman P, Luchtel D, Oda D. Neutrophil-mediated damage to human gingival epithelial cells. *J Periodontal Res*. 1992;27(1):70–9.
8. Waddington RJ, Moseley R, Embery G. Reactive oxygen species: a potential role in the pathogenesis of periodontal diseases. *Oral Dis.* 2000;6(3):138–51.
9. Canakçi CF, Cicek Y, Canakçi V. Reactive oxygen species and human inflammatory periodontal diseases. *Biochemistry*. 2005;70(6):619–28.
10. Sies H. Oxidative stress: oxidants and antioxidants. Exp Physiol. 1997;82:291- 95. [7] Halliwell B, Gutteridge JM. Free radicals in biology and medicine, 2nd ed. Oxford: Clarendon Press, 1989.
11. Battino M, Bullon P, Wilson M, Newman H. Oxidative injury and inflammatory periodontal diseases: the challenge of anti-oxidants to free radicals and reactive oxygen species. *Crit Rev Oral Biol Med*. 1999;10(4):458–76.
12. Littarru GP, Nakamura R, Ho L, Folkers K, Kuzell WC. Deficiency of coenzyme Q10 in gingival tissue from patients with periodontal disease. *Proc Natl Acad Sci U S A*. 1971;68(10):2332–5.
13. Hansen IL, Iwamoto Y, Kishi T, Folkers K, Thompson LE. Gingival and leucocytic deficiencies of coenzyme Q10 in patients with periodontal disease. *Res Commun Chem Pathol Pharmacol*. 1976;14(4):729–38.
14. Loesche WJ, Grossman NS. Periodontal disease as a specific, albeit chronic, infection: diagnosis and treatment. *Clin Microbiol Rev*. 2001;14(4):727–52.
15. Lamster IB, Novak MJ. Host mediators in gingival crevicular fluid: implications for the pathogenesis of periodontal disease. *Crit Rev Oral Biol Med*. 1992;3(1-2):31–60.
16. Nakamura R, Littarru GP, Folkers K, Wilkinson EG. Study of CoQ1o-enzymes in gingiva from patients with periodontal disease and evidence for a deficiency of Coenzyme Q10. *Proc Natl Acad Sci USA*. 1974;71(4):1456–60.
17. Wilkinson EG. Bioenergetics in clinical medicine.II. Adjunctive treatment with coenzyme Q in periodontal treatment. *Res Commun Chemic Path Pharmac*. 1975;12(1);111–23.
18. Shizukuishi S, Hanioka T, Tsunemitsu A, Fukunaga Y, Kishi T, Sato N. Clinical effect of Coenzyme 010 on periodontal disease; evaluation of oxygen utilisation in gingiva by tissue reflectance spectrophotometry. In: Biomedical and clinical aspects of Coenzyme Q. Amsterdam: Elsevier; 1986;5:359-68
19. McRee JT, Hanioka T, Shizukuishi S, Folkers K. Therapy with Coenzyme Q10 for patients with periodontal disease. 1. Effect of Coenzyme Q10 on subgingival micro-organisms. *J Dent Health*. 1993;43:659–66.
20. Thomas AE, Varma B, Kurup S, Jose R, Chandy ML, Kumar SP, et al. Evaluation of Efficacy of 1% Cur- cuminoids as Local Application in Management of Oral Lichen Planus- Interventional Study. *J Clin Diagn Res*. 2017;11(4):89–93.

Cite this article: Chintale S, Vishwakarma P, Zadode AS, Ghune D, Chhabile S, Wankhede S. Clinical evaluation of topical application of anti-oxidant coenzyme Q10 on periodontal status in diabetic patients-Randomized control trial. *J Dent Spec*. 2025;13(2):267-274.