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Evaluating the Efficacy of Placental Extract Gel (Placentrex®) and High Concentration Oxygen Oral Gel (Blue®M) TM as an Adjunct to Scaling and Root Planing in Stage II Periodontitis Patients: A Randomized Controlled Clinical Trial

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Abstract

Introduction: Periodontitis is a chronic disease-causing tissue damage and tooth loss; while antibiotics help reduce the pathogens, new adjunctive treatments are emerging. Human placental extracts, rich in NADPH, promote nitric oxide-mediated healing and may improve outcomes after non-surgical periodontal therapy. Additionally, oxygen supports healing by enhancing cellular metabolism, bacterial clearance, and tissue regeneration; slow-release formulations like Blue®M gel target anaerobic bacteria in periodontal pockets. Therefore, this study investigated the clinical efficacy of placental extract gel (Placentrex®), high concentration oxygen oral gel (Blue®M) TM as an adjunct to scaling and root planning in stage II periodontitis patients.

Method: Study subjects with stage II periodontitis having at least two non-adjacent teeth with probing pocket depth of 3 to 4mm, who met the inclusion criteria were enrolled for the study. The sample size of 8 patients per group was taken. The total sample size was 24 for two groups.

Group A: 20 sites received SRP + Placentrex®

Group B: 20 sites will receive SRP + Blue®M

Group C: 20 sites will receive SRP. Clinical parameters evaluated at 4 weeks & 8-week intervals where, Gingival Index (GI), Modified Papillary Bleeding Index (MPBI), Probing Pocket Depth (PPD) and Clinical Attachment Level (CAL).

Results: Both Placentrex® and Blue®M gels showed equal improvements in improving the clinical parameters at 4 weeks & 8-week intervals than SRP group alone.

Conclusion: Incorporating Placentrex® and Blue®M as local drug delivery after SRP may serve as a beneficial adjunctive therapy in improving the clinical parameters in stage II periodontitis.

Keywords: Periodontitis, Placentrex®, Blue®M, Scaling and Root Planing (SRP), Clinical Parameters, Adjunctive Therapy

Introduction

Periodontitis encompasses a group of related inflammatory diseases that result in the progressive destruction of the tooth-supporting structures, primarily triggered by microbial plaque and bacterial infections. The formation of a highly structured and complex biofilm in the periodontal pocket, predominantly consisting of Gram-negative anaerobic bacteria such as A. actinomycetemcomitans and P. gingivalis, initiates and perpetuates periodontal attachment loss. As the biofilm extends subgingivally, it becomes increasingly difficult for patients to manage with routine oral hygiene[1].

Scaling and root planing (SRP) continues to be the gold standard for periodontal therapy; however, due to anatomical complexities and the persistence of deep periodontal pockets, SRP alone often does not achieve complete debridement, necessitating surgical intervention or adjunctive treatments [2].

Various locally delivered antimicrobial systems, including chlorhexidine gel, have been investigated as either monotherapy or adjuncts to SRP to enhance bacterial control and improve clinical outcomes. While systemic antibiotics have also been employed, concerns regarding resistance development and the need for higher dosages to achieve effective gingival crevicular fluid concentrations have limited their routine use, further supporting the shift towards local drug delivery systems [3].

Human placental extract is gaining attention as a novel adjunctive therapy for periodontal wound healing due to its rich content of bioactive molecules, including proteins, growth factors, enzymes, and nucleotides. These components promote cell migration, collagen production, and tissue regeneration while reducing inflammation by suppressing IL-6 and IL-8. The extract also contains NADPH, which supports nitric oxide-mediated wound healing, aids in debridement, bacterial clearance, and re-epithelialization. Studies have shown its potential to stimulate metabolic activity in periodontal cells, enhance matrix formation, and offer antibacterial effects against drug-resistant strains. Used alongside scaling and root planing (SRP), human placental extract may significantly improve healing outcomes in chronic periodontitis[2,3].

In addition to microbial factors, oxidative stress, and reactive oxygen species (ROS) have emerged as key contributors in the pathogenesis of periodontitis. Though ROS play a role in normal biological processes and tissue repair at low levels, their excessive accumulation can lead to tissue damage and inflammation. These reactive species, including singlet oxygen and hydrogen peroxide, also function as intracellular signaling molecules and may influence cellular processes such as autophagy and apoptosis[6].

In response to these multifactorial etiologies, novel therapeutic agents such as BlueM® oral gel have been developed. Designed by implantologists, oral surgeons, and dentists, this oxygen-releasing gel is claimed to enhance wound healing, reduce inflammation, and improve oral hygiene by increasing oxygen levels in periodontal pockets, improving early stages of periodontitis, and treating oral infections following trauma, extractions, or implant procedures.[4]

The present study aimed to compare the efficacy of placental extract gel (Placentrex®) and high concentration oxygen oral gel (Blue®M) as an adjunct to scaling and root planing in stage II periodontitis patients.

Materials and Methods

Study Design and Population

This randomized controlled clinical trial was conducted in the Department of Periodontology and Implantology of MGV's KBH Dental College and Hospital, Nashik, Maharashtra. The protocol for this clinical trial was registered in the Clinical Trials Registry, India (ICMR-NIMS) (CTRI/2025/05/087694). Ethical approval was obtained from the KBH Dental College Institutional Ethics Committee (EC/NEW/INST/2020/931).

The study enrolled 20 sites in 24 participants with Stage II periodontitis.

The inclusion criteria consisted of individuals aged 18 - 45 years with at least two non-adjacent teeth with probing depth 4 mm[8]. Systemically healthy patients. The exclusion criteria encompassed individuals with systemic diseases that could impact periodontal health, patients having protective or orthodontic appliances. Patients who are smokers or using any other tobacco products. Female patients who are pregnant and lactating. The study design was a randomized controlled trial and individual were divided randomly by computer generated random assignment program for allocation to equally distribute them into the three groups,

Group A: 20 sites will receive SRP + Placentrex®

Group B: 20 sites will receive SRP + Blue®M

Group C: 20 sites received SRP.

Treatment Procedure

After the selection of sites according to inclusion and exclusion criteria, in first visit a detailed case history was recorded and clinical examination was done. The patients were assessed for the following clinical parameters: Gingival Index (GI) (Loe and Silness,1963)(1,9), Modified Papillary Bleeding Index (MPBI) (Barnett et al.,1980)[1,9], Probing pocket depth (PPD)(1) and Clinical attachment level (CAL)(1). A single investigator assessed these parameters using a University of North Carolina-15 (UNC-15) periodontal probe[1]. After the examination, the study was explained to the selected subjects. Informed consent was obtained from subjects in their preferred language. In second visit, complete scaling and root planing was done. Only those sites with probing pocket depth of 4mm were selected[8]. Each Patient was randomly divided into three groups. Baseline clinical parameters were recorded. Administration of Placentrex® gel and Blue®M gel in the periodontal pockets (up to the marginal gingiva) was carried out using syringe and needle (respective gels were loaded in separate syringes each). Post-operative instructions were explained to the patient, which were as follows:

a. Maintain good oral hygiene with regular tooth brushing with soft toothbrush and toothpaste and rinsing the mouth after every meal.

b. Do not use any mouthwash/mouthrinse until prescribed.

Figure 1: a. Placentrex® gel loaded in syringe;
b. Probing pocket depth checked using University of North Carolina-15 (UNC-15) periodontal probe;
c. Administration of Placentrex® gel in the periodontal pockets;
d. Follow up after 4 weeks; **e.** Follow up after 8 weeks.

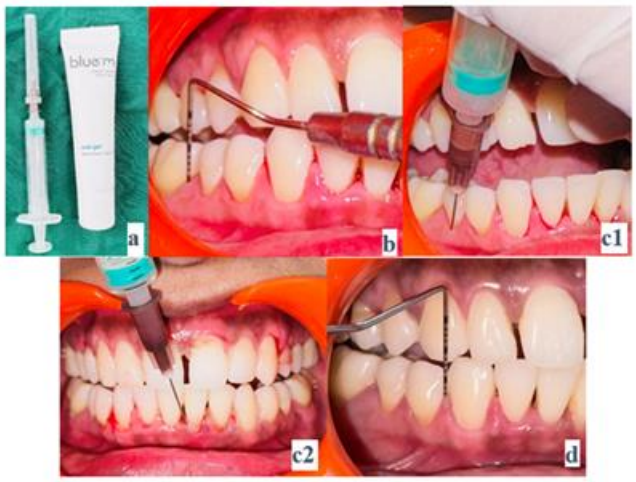


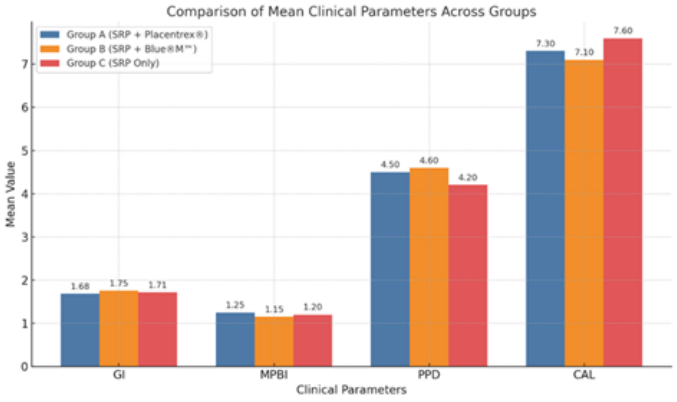
Figure 1: b. BlueM gel loaded in syringe;
b. Probing pocket depth checked using University of North Carolina-15 (UNC-15) periodontal probe;
c. Administration of BlueM gel in the periodontal pockets;
d. Follow up after 4 weeks; e. Follow up after 8 weeks.

Results

Table 1: Descriptive Statistics Table (Baseline Characteristics of Study Groups)

Parameter	Group A (SRP + Placentrex®)	Group B (SRP + Blue®M™)	Group C (SRP Only)	p-value
GI (mean ± SD)	1.68 ± 0.32	1.75 ± 0.25	1.71 ± 0.35	0.43
MPBI (mean ± SD)	1.25 ± 0.41	1.15 ± 0.26	1.2 ± 0.42	0.69
PPD (mean ± SD, mm)	4.5 ± 0.25	4.60 ± 0.45	4.2 ± 0.41	0.85
CAL (mean ± SD, mm)	7.3 ± 0.52	7.1 ± 0.42	7.6 ± 0.14	0.39

Graph 1: Descriptive Statistics Table (Baseline Characteristics of Study Groups)



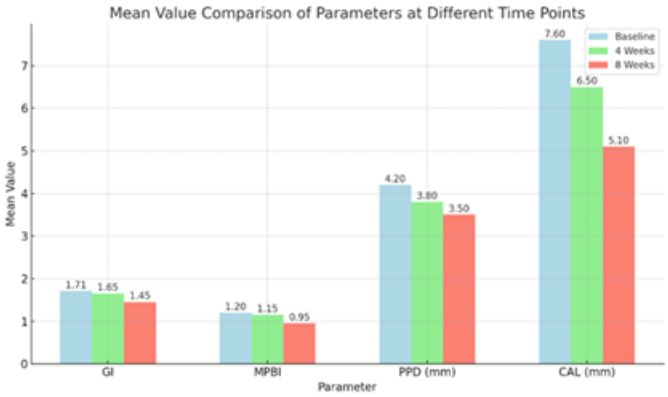
The table 1 presents the baseline characteristics of the study groups before undergoing treatment. The Gingival Index (GI) values were relatively similar across all groups, with Group B (SRP + Blue®M™) having the highest mean value of 1.75 ± 0.25, followed by Group C (SRP only) at 1.71 ± 0.35 and Group A (SRP + Placentrex®) at 1.68 ± 0.32, with a p-value of 0.43, indicating no significant difference in baseline gingival inflammation among groups. The Modified Plaque Bleeding Index (MPBI) was slightly lower in Group B (1.15 ± 0.26) compared to Group C (1.2 ± 0.42) and Group A (1.25 ± 0.41), but the p-value (0.69) suggests

that the differences were not statistically significant. Similarly, Probing Pocket Depth (PPD) ranged between 4.2 mm and 4.6 mm, with Group B showing the highest mean value (4.60 ± 0.45 mm) and Group C showing the lowest (4.2 ± 0.41 mm), yet the p-value (0.85) indicates that there was no significant difference in baseline pocket depth across groups. Lastly, the Clinical Attachment Level (CAL) showed slight variations, with Group C exhibiting the highest mean value (7.6 ± 0.14 mm), followed by Group A (7.3 ± 0.52 mm) and Group B (7.1 ± 0.42 mm), but the p-value (0.39) indicates no statistically significant baseline differences in attachment levels.

Table 2a: Intragroup Comparison (Within-Group Analysis) SRP only.

Parameter	Baseline (Mean ± SD)	4 Weeks	8 Weeks	p-value
GI	1.71 ± 0.35	1.65 ± 0.32	1.45 ± 0.25	0.005
MPBI	1.2 ± 0.42	1.15 ±0.31	0.95 ± 0.36	0.90
PPD (mm)	4.2 ± 0.41	3.8 ± 0.35	3.5 ± 0.52	0.15
CAL (mm)	7.6 ± 0.14	6.5 ± 0.65	5.1 ± 0.45	0.003

Graph 2a: Intragroup Comparison (Within-Group Analysis) SRP only.



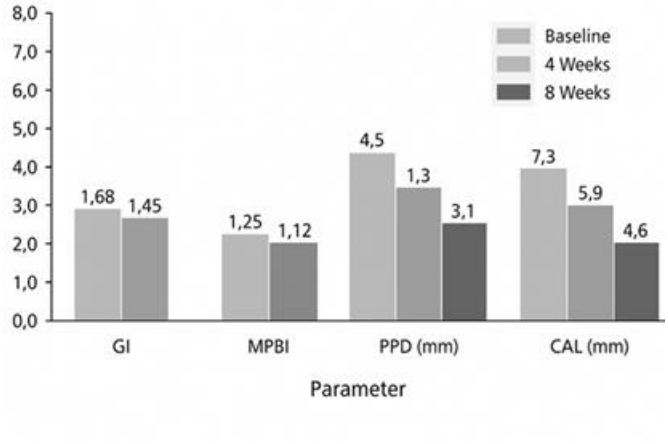
The table 2a presents an intragroup comparison of various periodontal parameters following Scaling and Root Planing (SRP) treatment over different time intervals—baseline, 4 weeks, and 8 weeks. The Gingival Index (GI), which measures inflammation severity, showed a gradual reduction from 1.71 ± 0.35 at baseline to 1.45 ± 0.25 at 8 weeks, with a statistically significant p-value of 0.005, indicating meaningful improvement in gingival health. The Modified Plaque Bleeding Index (MPBI) also declined from 1.2 ± 0.42 at baseline to 0.95 ± 0.36 at 8 weeks, though its p-value of 0.90 suggests that the change was not statistically significant. Probing Pocket Depth (PPD) decreased from 4.2 ± 0.41 mm at baseline to 3.5 ± 0.52 mm at 8 weeks, with a p-value of 0.15, indicating an improvement but lacking strong statistical significance. Clinical Attachment Level (CAL) showed a marked reduction from 7.6 ± 0.14 mm at baseline to 5.1 ± 0.45 mm at 8 weeks, with a highly significant p-value of 0.003, suggesting substantial periodontal healing. These findings indicate that SRP led to improvements in periodontal health, particularly in GI and CAL, while changes in MPBI and PPD were less statistically significant.

Table 2b: Intragroup Comparison (Within-Group Analysis) Group A (SRP + Placentrex®).

Parameter	Baseline (Mean ± SD)	4 Weeks	8 Weeks	p-value
GI	1.68 ± 0.32	1.45 ± 0.51	1.25 ± 0.31	<0.001
MPBI	1.25 ± 0.41	1.12 ± 0.42	0.91 ± 0.25	0.01

PPD (mm)	4.5 ± 0.25	3.8 ± 0.24	3.1 ± 0.21	0.001
CAL (mm)	7.3 ± 0.52	5.9 ± 0.51	4.6 ± 0.45	0.005

Graph 2b: Intragroup Comparison (Within-Group Analysis) Group A (SRP + Placentrex®).



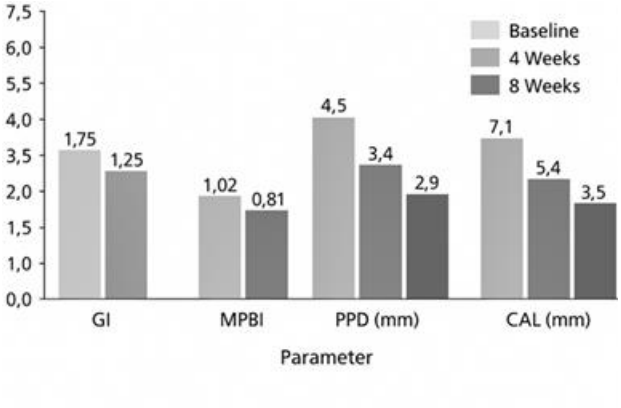
The table 2b presents the intragroup comparison for Group A, which underwent Scaling and Root Planing (SRP) combined with Placentrex® treatment, evaluating periodontal parameters over baseline, 4 weeks, and 8 weeks. The Gingival Index (GI) showed a progressive decline from 1.68 ± 0.32 at baseline to 1.25 ± 0.31 at 8 weeks, with a highly significant p-value of <0.001, indicating a notable reduction in gingival inflammation post-treatment. Similarly, the Modified Plaque Bleeding Index (MPBI) decreased from 1.25 ± 0.41 at baseline to 0.91 ± 0.25 at 8 weeks, with a p-value of 0.01, demonstrating statistically significant improvement in plaque-related bleeding.

The Probing Pocket Depth (PPD) showed a considerable reduction from 4.5 ± 0.25 mm at baseline to 3.1 ± 0.21 mm at 8 weeks, with a p-value of 0.001, suggesting enhanced periodontal pocket depth healing. The Clinical Attachment Level (CAL) also exhibited a marked improvement, reducing from 7.3 ± 0.52 mm at baseline to 4.6 ± 0.45 mm at 8 weeks, with a p-value of 0.005, confirming significant periodontal attachment gain.

Table-2c: Intragroup Comparison (Within-Group Analysis) Group B (SRP + Blue®M™).

Parameter	Baseline (Mean ± SD)	4 Weeks	8 Weeks	p-value
GI	1.75 ± 0.25	1.25 ± 0.62	1.05 ± 0.24	<0.001
MPBI	1.15 ± 0.26	1.02 ± 0.21	0.81 ± 0.20	<0.001
PPD (mm)	4.60 ± 0.45	3.4 ± 0.52	2.9 ± 0.23	<0.001
CAL (mm)	7.1 ± 0.42	5.4 ± 0.23	3.5 ± 0.25	<0.001

Graph 2c:



The table 2c presents the intragroup comparison for Group B, which received Scaling and Root Planing (SRP) combined with Blue®M™ treatment, tracking periodontal changes over baseline, 4 weeks, and 8 weeks. The Gingival Index (GI) showed a substantial reduction from 1.75 ± 0.25 at baseline to 1.05 ± 0.24 at 8 weeks, with a highly significant p-value of <0.001, indicating a marked improvement in gingival health. Similarly, the Modified Plaque Bleeding Index (MPBI) steadily decreased from 1.15 ± 0.26 at baseline to 0.81 ± 0.20 at 8 weeks, with a p-value of <0.001, confirming significant improvement in plaque-related bleeding control.

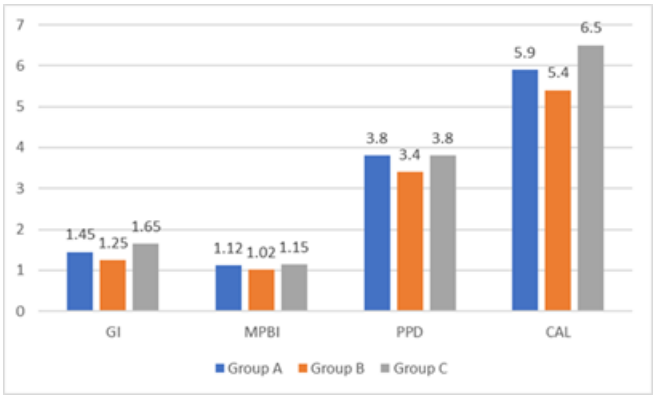
The Probing Pocket Depth (PPD) exhibited notable reductions from 4.60 ± 0.45 mm at baseline to 2.9 ± 0.23

mm at 8 weeks, with a strongly significant p-value of <0.001, suggesting effective periodontal pocket reduction. Likewise, the Clinical Attachment Level (CAL) improved considerably, decreasing from 7.1 ± 0.42 mm at baseline to 3.5 ± 0.25 mm at 8 weeks, with a p-value of <0.001, reinforcing statistically significant attachment gain.

Table 3: Intergroup Comparison at Each Time Point at 4 Weeks.

Parameter	Group A	Group B	Group C	p-value (ANOVA/Kruskal-Wallis)
GI	1.45 ± 0.51	1.25 ± 0.62	1.65 ± 0.32	0.0378
MPBI	1.12 ± 0.42	1.02 ± 0.21	1.15 ±0.31	0.089
PPD	3.8 ± 0.24	3.4 ± 0.52	3.8 ± 0.35	0.045
CAL	5.9 ± 0.51	5.4 ± 0.23	6.5 ± 0.65	0.032

Graph 3: Intergroup Comparison at Each Time Point at 4 Weeks.



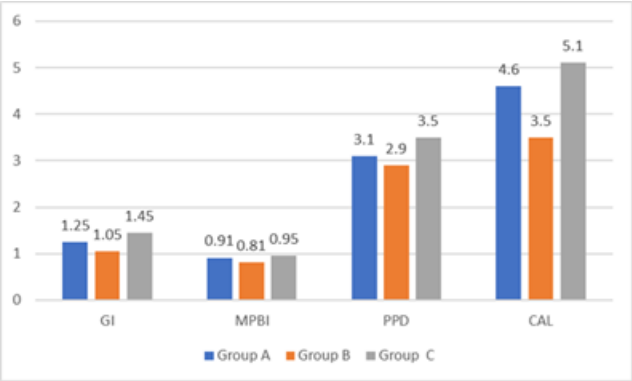
In table 3 at 4-week mark, an intergroup comparison was conducted among Group A (SRP + Placentrex®), Group B (SRP + Blue®M™), and Group C (SRP only) to evaluate differences in periodontal parameters. The Gingival Index (GI) showed the most improvement in Group B (1.25 ± 0.62) compared to Group A (1.45 ± 0.51) and Group C (1.65 ± 0.32), with a statistically significant p-value of 0.0378, indicating better gingival health in Groups A and B compared to SRP alone. The Modified Plaque Bleeding Index (MPBI) decreased across all groups, with Group B (1.02 ± 0.21) showing the most improvement; however, the p-value (0.089) suggests that the differences were not statistically significant.

In terms of Probing Pocket Depth (PPD), Group B (3.4 ± 0.52 mm) exhibited the greatest reduction compared to Group A (3.8 ± 0.24 mm) and Group C (3.8 ± 0.35 mm), with a p-value of 0.045, confirming a statistically significant difference. Similarly, Clinical Attachment Level (CAL) showed notable reductions, with Group B (5.4 ± 0.23 mm) demonstrating the best improvement, followed by Group A (5.9 ± 0.51 mm) and Group C (6.5 ± 0.65 mm), with a p-value of 0.032, indicating superior attachment gain in Group B.

Table 4: Intergroup Comparison at Each Time Point at 8 Weeks.

Parameter	Group A	Group B	Group C	p-value (ANOVA/Kruskal-Wallis)
GI	1.25 ± 0.31	1.05 ± 0.24	1.45 ± 0.25	0.037
MPBI	0.91 ± 0.25	0.81 ± 0.20	0.95 ± 0.36	0.072
PPD	3.1 ± 0.21	2.9 ± 0.23	3.5 ± 0.52	0.039
CAL	4.6 ± 0.45	3.5 ± 0.25	5.1 ± 0.45	0.028

Graph 4: Intergroup Comparison at Each Time Point at 8 Weeks.



In table 4 at the 8-week time point, an intergroup comparison was conducted among Group A (SRP + Placentrex®), Group B (SRP + Blue®M™), and Group C (SRP only) to evaluate differences in periodontal health parameters. The Gingival Index (GI) showed the greatest reduction in Group B (1.05 ± 0.24) compared to Group A (1.25 ± 0.31) and Group C (1.45 ± 0.25), with a statistically significant p-value of 0.037, confirming enhanced gingival health in Groups A and B compared to SRP alone. The Modified Plaque Bleeding Index (MPBI) demonstrated improvements across all groups, with Group B (0.81 ± 0.20) showing the greatest reduction. However, the p-value (0.072) suggests that these differences were not statistically significant.

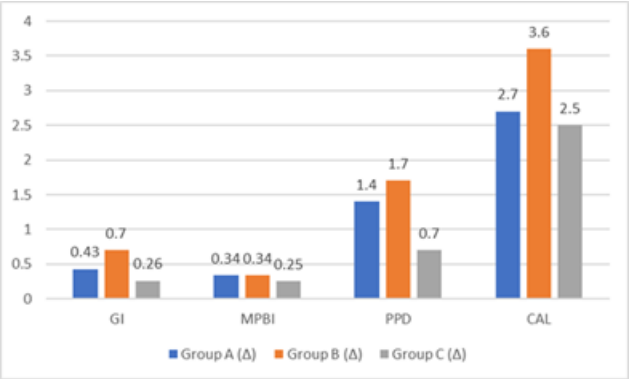
Regarding Probing Pocket Depth (PPD), Group B (2.9 ± 0.23 mm) exhibited the most substantial improvement, followed by Group A (3.1 ± 0.21 mm) and Group C (3.5 ± 0.52 mm), with a significant p-value of 0.039, reinforcing the superior effect of adjunct therapies. Similarly, Clinical Attachment Level (CAL) showed notable improvements, with Group B (3.5 ± 0.25 mm) demonstrating the greatest attachment gain, followed by Group A (4.6 ± 0.45 mm) and Group C (5.1 ± 0.45 mm), with a statistically significant p-value of 0.028, indicating better periodontal healing in Groups A and B.

After 8 weeks, all groups showed improvements in periodontal health, but Group B (SRP + Blue®M™) exhibited the most pronounced benefits, particularly in GI, PPD, and CAL, with statistically significant differences compared to SRP alone. Group A also showed notable gains, though less than Group B. While MPBI improved across all groups, the differences were not statistically significant. These findings suggest that Blue®M™ had the most substantial impact on periodontal healing, reinforcing its effectiveness as an adjunct therapy to SRP.

Table 5: Mean Change from Baseline to 8 Weeks.

Parameter	Group A (Δ)	Group B (Δ)	Group C (Δ)	p-value (ANOVA)
GI	0.43	0.70	0.26	0.021
MPBI	0.34	0.34	0.25	0.067
PPD	1.4	1.70	0.7	0.012
CAL	2.7	3.6	2.5	0.008

Graph 5: Mean Change from Baseline to 8 Weeks



The table presents the mean change in periodontal parameters from baseline to 8 weeks across Group A (SRP + Placentrex®), Group B (SRP + Blue®M™), and Group C (SRP only), analyzed using ANOVA to determine statistical significance. The Gingival Index (GI) showed the highest reduction in Group B (Δ = 0.70) compared to Group A (Δ = 0.43) and Group C (Δ = 0.26), with a statistically significant p-value of 0.021, indicating superior gingival health improvement in Group B. Similarly, the Modified Plaque Bleeding Index (MPBI) demonstrated reductions across all groups, with Groups A and B (both Δ = 0.34) exhibiting greater improvements than Group C (Δ = 0.25). However, the p-value (0.067) suggests that the differences were not statistically significant.

Regarding Probing Pocket Depth (PPD), Group B (Δ = 1.70 mm) exhibited the greatest reduction, followed by Group A (Δ = 1.4 mm) and Group C (Δ = 0.7 mm), with a highly significant p-value of 0.012, confirming superior periodontal pocket depth improvement in Groups A and B. Similarly, the Clinical Attachment Level (CAL) showed substantial improvement, with Group B (Δ = 3.6 mm) demonstrating the most attachment gain, followed by Group A (Δ = 2.7 mm) and Group C (Δ = 2.5 mm), with a strong statistical significance (p-value = 0.008), reinforcing the enhanced therapeutic effect of Placentrex® and Blue®M™ compared to SRP alone.

Discussion

The present randomized controlled clinical trial assessed and compared the efficacy of two novel adjunctive agents—Placental Extract Gel (Placentrex®) and High Concentration Oxygen Oral Gel (Blue®M™)—when used alongside conventional scaling and root planing (SRP) in the management of stage II periodontitis.

Overall, the results demonstrated that both adjunctive therapies produced statistically significant improvements in key clinical parameters, namely Gingival Index (GI), Modified Papillary Bleeding Index (MPBI), Probing Pocket Depth (PPD), and Clinical Attachment Level (CAL), when compared to SRP alone. These findings are in line with prior investigations emphasizing the potential of locally delivered bioactive agents in improving periodontal outcomes.

Placentrex®, a human placental extract, showed significant improvements across all clinical parameters, reinforcing its bio-regenerative and anti-inflammatory properties. Its rich composition of growth factors, cytokines, and NADPH likely contributed to enhanced tissue healing, angiogenesis, and reduction in pro-inflammatory mediators like IL-6 and IL-8. Studies have demonstrated that human fibronectin type III peptide, a component of placental extract, effectively promotes cell migration and accelerates wound healing processes. In the periodontal environment, these properties suggest significant potential for placental extract as an adjunctive therapy, particularly in enhancing soft tissue healing following scaling and root planing (SRP). Fluorescent screening techniques have identified the presence of biologically active NADPH within the extract, which plays a crucial role in nitric oxide synthesis—a key mediator in wound healing that aids in debridement of necrotic tissue, bacterial elimination, and re-epithelialization. An in vitro study by Akagi et al. [10]

further confirmed that placental extract stimulates type I collagen production and exhibits anti-inflammatory effects by down regulating pro-inflammatory cytokines such as interleukin-6 (IL-6) and interleukin-8 (IL-8), thereby promoting osteogenesis and angiogenesis. Traditionally used in a variety of medical applications—from wound healing and infertility treatment to neurological conditions—placental extract enhances metabolic activity in periodontal cells, providing the energy necessary to counteract inflammation and support tissue regeneration. Its content of polydeoxyribonucleotides and NADPH contributes to granulation tissue removal, bacterial control, and matrix formation, while additional constituents such as amino acids and small peptides improve cellular adhesion and proliferation. Moreover, its capacity to induce nitric oxide production and exhibit antibacterial activity against both conventional and drug-resistant bacterial strains offer protection against secondary infections in chronic wounds. These outcomes align with earlier studies, such as those by Sharma et al. (2020)[10] and Bhadauriya et al. (2024)[5], given these diverse therapeutic effects, the integration of human placental extract as a local drug delivery system in conjunction with SRP presents a novel and potentially effective strategy for managing chronic periodontitis and enhancing periodontal wound healing.

Blue®M™, on the other hand, yielded the most substantial clinical gains among the three groups. Its oxygen-releasing formulation is designed to increase local oxygen tension, aiding in the control of anaerobic pathogens and promoting wound healing through enhanced cellular metabolism and bacterial clearance. The observed reductions in PPD and CAL in the Blue®M™ group were statistically superior at both 4 and 8 weeks, compared to both SRP alone and SRP with Placentrex®. These findings corroborate those reported by Koul et al. (2020)[7], who highlighted the effectiveness of Blue®M™ in improving periodontal parameters via oxygen delivery to hypoxic pocket environments. Blue®M GEL is suggested to restore and maintain a healthy microbial homeostasis. Studies have demonstrated a significant shift in microbial composition toward a homeostasis state of biofilm after applying oxygen therapy (Fernandez y Mostajo et al., 2014; Fernandez y Mostajo et al., 2017)[11]. Niveda and Kaarthikeyan reported a significant reduction in probing pocket depth in patients with chronic periodontitis treated with Blue®M oxygen therapy, confirming its clinical advantage on periodontitis (Niveda, and Kaarthikeyan, 2020)[12]. Although MPBI improvements were not statistically significant across intergroup comparisons, intragroup reductions indicate a favourable trend in bleeding control with both adjuncts. This may be attributed to a limitation in sample size, as a larger cohort may yield clearer differences.

Importantly, the SRP-only group also showed moderate improvements, particularly in GI and CAL, confirming the foundational role of mechanical debridement. However, the slower rate and lower magnitude of change in these parameters underscore the limitations of SRP as a standalone treatment, especially in cases where deep pockets or anatomical challenges compromise access.

Taken together, the findings of this study suggest that adjunctive application of Placentrex® and Blue®M™ enhances the therapeutic efficacy of SRP. While both agents offer clinical benefit, Blue®M™ demonstrated relatively greater improvements, potentially making it the preferred adjunct in the non-surgical management of stage II periodontitis.

However, this study has certain limitations. The short duration (8 weeks) limits understanding of the long-term effects and sustainability of periodontal improvements.

Additionally, the relatively small sample size may restrict generalizability. Future studies with extended follow-up periods, microbiological and immunological assessments, and larger populations are warranted to validate and expand upon these findings.

Conclusion

This randomized controlled clinical trial demonstrated that both Placentrex® and Blue®M™ oral gels, when used as adjuncts to scaling and root planing (SRP), significantly enhanced periodontal healing in patients with stage II periodontitis. Both agents resulted in notable improvements in clinical parameters, including Gingival Index (GI), Modified Papillary Bleeding Index (MPBI), Probing Pocket Depth (PPD), and Clinical Attachment Level (CAL), when compared to SRP alone.

Among the two adjuncts, Blue®M™ showed slightly superior outcomes in reducing inflammation, probing depth, and attachment loss, likely due to its oxygen-releasing mechanism that enhances local healing and microbial control. Placentrex®, enriched with bioactive molecules and growth factors, also proved to be an effective adjunct, supporting its regenerative and anti-inflammatory properties in periodontal therapy.

The study supports the use of localized drug delivery systems like Placentrex® and Blue®M™ as promising adjunctive treatments in non-surgical periodontal therapy. Incorporating such adjuncts could offer improved clinical outcomes, reduced need for surgical intervention, and enhanced patient care. Future studies with larger sample sizes and extended follow-up durations are recommended to further substantiate these findings and explore the long-term benefits of these therapies.

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