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A Comparative Evaluation of the Efficacy of Diode laser as an adjunct to Conventional Flap Surgery versus Conventional flap surgery alone in the treatment of Chronic Periodontitis - A Systematic Review

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2023110046

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 10 November 2023 and was last updated on 10 November 2023.

INTRODUCTION

Review question / Objective Is there a difference in the effectiveness of Diode lasers as an adjunct to Conventional Flap Surgery versus Conventional flap surgery alone in patients with Chronic Periodontitis as measured by clinical parameters?

Condition being studied Periodontitis is an inflammatory disease caused by opportunistic bacteria residing in the oral cavity which causes periodontal breakdown, resulting in tooth loss. The purpose of periodontal therapy is to reduce or eliminate the subgingival microorganisms associated with periodontal disease, regenerate the lost tissues, and to maintain periodontal health. Complete mechanical debridement is considered to be the “gold standard” treatment of periodontitis. The surgical procedure involving treatment of periodontal pockets by modified Widman flap (MWF) approach mainly aims at reattachment and readaptation of the pocket walls rather than the surgical eradication of the outer

walls of the pockets. Regardless of the treatment modality, surgical periodontal therapy is often associated with pain and discomfort. In recent years, the use of lasers as an adjunct to conventional mechanical procedures is commonly employed in the treatment of periodontal diseases. Adequate sterilization, hemostasis, and less postoperative pain have been found in surgical procedures performed with diode laser compared to conventional surgical techniques. Diode laser having a wavelength of 810 nm or 910–980 nm, mainly targets the diseased soft tissues without interacting with dental hard tissues.

METHODS

Search strategy A systematic search following the principle of systematic review search will be carried out in the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, PubMed and Google Scholar using MeSH words, text words and Boolean operators. The articles in the English language. The period of publication considered will be years 1-1-2012 to 1-10-2023.

Participant or population Studies with systemically healthy patients aged between 20 - 50 yrs that are diagnosed with chronic periodontitis requiring periodontal flap surgery.

Intervention Studies assessing the efficacy of surgical periodontal treatment using a laser (diode) as an adjunct to Conventional Flap Surgery.

Comparator To compare the effectiveness of diode lasers as an adjunct to Conventional Flap Surgery versus Conventional flap surgery alone in the treatment of patients with chronic periodontitis.

Study designs to be included Randomized Controlled Trial, Clinical study.

Eligibility criteria INCLUSION: 1. Systemically healthy pts 2. Age range 20-60 yrs 3. Pocket depth \geq 5 mm 4. Clinical attachment level $>$ 4 mm 5. 2 quadrants / sextants having 1/3 teeth each 6. Post phase 1 therapy 7. Pts who signed an informed consent 8. Published in English language only 9. With full text articles 10. Published btw 2012 – 2023 EXCLUSION 1. Smoking 2. Pregnancy, Lactating, Postmenopausal women 3. Having systemic diseases 4. H/O of antibiotic or steroidal therapy within 3/6 months 5. H/O of drug allergy 6. H/O of previous periodontal surgery within 6/12 months 7. No laser biostimulation done post suturing 8. Uncooperative pt 9. Poor oral hygiene 10. Intra bony defect 11. Who require extensive osseous manipulation 12. Grade 2/3 mobility 13. Generalised recession.

Information sources A systematic search following the principle of systematic review search will be carried out in the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, PubMed and Google Scholar using MeSH words, text words and Boolean operators. The articles in the English language. The period of publication considered will be years 1-1-2012 to 1-10-2023.

Main outcome(s) Reduction in Probing Pocket Depth (PPD) and Gain in Clinical attachment level (CAL).

Additional outcome(s) Visual Analog Scale (VAS) scores, Plaque Index (PI), Gingival Index (GI).

Data management Titles and/or abstracts of studies retrieved using the search strategy and those from additional sources will be screened independently by two review authors to identify studies that potentially meet the inclusion criteria outlined above. The full texts of these potentially eligible studies will be retrieved and independently

assessed for eligibility by two review team members. Any disagreements between them will be solved by discussion with the third review author. Two review authors will extract data independently and third author will cross check the data. Discrepancies will be identified and resolved through discussion (with a third author where necessary). The following data were extracted from the included studies:

1. Authors name
2. Year of study
3. Number of participants (Male/Female)
4. Age (Years)
5. Study Design
6. Type of defect
7. Laser wavelength
8. Surgery Type – Test & Control
9. Outcome
10. Follow up
11. Result
12. Conclusion.

Quality assessment / Risk of bias analysis Risk of Bias for the selected randomized controlled trials (RCTs) was executed by using the Cochrane Collaboration Tool 16 (<http://ohg.cochrane.org>) which including random sequence generation, allocation concealment, blinding of participants, incomplete outcome data, selective reporting, and other bias.

Strategy of data synthesis Synthesis of results if adequate, statistical analysis will be done.

Subgroup analysis Appropriate sub group analysis if possible will be conducted.

Sensitivity analysis Appropriate sensitivity analysis if possible will be conducted.

Language restriction English.

Country(ies) involved India.

Keywords diode laser; conventional flap surgery; chronic periodontitis.

Dissemination plans Yes.

Contributions of each author

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