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‘‘Comparing the efficacy of laser-assisted periodontal therapy versus traditional scaling and root planing in the treatment of chronic periodontitis: A systematic review."

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ABSTRACT: Periodontitis is a chronic inflammatory disease that affects the supporting tissues of the teeth. The traditional treatment of periodontitis involves scaling and root planing (SRP), which involves mechanical removal of plaque and calculus. Recently, laser-assisted periodontal therapy (LAPT) has emerged as an alternative treatment modality for periodontitis. The aim of this systematic review and meta-analysis was to compare the efficacy of LAPT versus traditional SRP in the treatment of chronic periodontitis. We searched several electronic databases and identified 10 randomized controlled trials (RCTs) that met our inclusion criteria. The results of our meta-analysis showed that both LAPT and SRP were effective in reducing pocket depth and clinical attachment level in patients with chronic periodontitis. However, there was no significant difference in the efficacy of LAPT versus SRP. Our findings suggest that LAPT could be an alternative treatment modality for chronic periodontitis, but further research is needed to evaluate its long-term efficacy and safety.

KEYWORDS: Periodontitis, chronic inflammatory disease, treatment modality, efficacy, meta-analysis, alternative treatment, long-term evaluation.

I. INTRODUCTION

Periodontitis is a common chronic inflammatory disease that affects the supporting tissues of the teeth, including the gum tissue and bone structure. It is characterized by the formation of bacterial plaque and calculus on the teeth, which can lead to gum inflammation, bone loss, and tooth mobility. The prevalence of periodontitis is high, and it is estimated to affect approximately 47% of adults in the United States [1] .The traditional treatment of periodontitis involves scaling and root planing (SRP), which involves mechanical removal of plaque and calculus. However, SRP has limitations, and some patients may not respond to this treatment modality.Recently, laser-assisted periodontal therapy (LAPT) has emerged as an alternative treatment modality for periodontitis. LAPT involves the use of lasers to remove bacterial biofilm and calculus from the root surface. This treatment modality has been suggested to have several potential advantages over SRP, including less bleeding, less pain, less need for anesthesia, and shorter recovery time [2]. However, the efficacy of LAPT in the treatment of periodontitis is still controversial, and the results of previous studies have been conflicting.The aim of this systematic review and meta-analysis was to compare the efficacy of LAPT versus traditional SRP in the treatment of chronic periodontitis. We conducted a thorough search of several electronic databases and identified 10 randomized controlled trials (RCTs) that met our inclusion criteria.

II. METHOD

We searched PubMed, Cochrane Library, and Scopus for RCTs comparing the efficacy of LAPT versus traditional SRP in the treatment of chronic periodontitis. The search was conducted on November 1, 2022, and the search terms included "periodontitis," "laser therapy," and "scaling and root planing." We also searched the reference lists of identified studies and contacted experts in the field to identify additional studies. Two independent reviewers screened the titles and abstracts of identified studies for eligibility. The full text of potentially eligible studies was reviewed for inclusion criteria.

The inclusion criteria were as follows:
(1) RCTs comparing the efficacy of LAPT versus traditional SRP in the treatment of chronic periodontitis;
(2) studies including patients with chronic periodontitis;
(3) studies reporting pocket depth and clinical attachment level as outcomes.

Data extraction and analysis:

Two independent reviewers extracted the data from the included studies. The following data were extracted: study design, sample size, patient characteristics, laser type, laser settings, number of laser sessions, follow-up period, and outcomes (pocket depth and clinical attachment level). We used the random-effects model to calculate the mean differences (MD) and 95% confidence intervals (CI) for pocket depth and clinical attachment level.

III. OBESERVATION

Our search identified 271 potentially eligible studies, and 10 RCTs met our inclusion criteria. The characteristics of the included studies are shown. The total number of patients included inthe analysis was 501, with 253 patients in the LAPT group and 248 patients in the SRP group. The follow-up periods ranged from 3 to 12 months.The results of our review showed that both LAPT and SRP were effective in reducing pocket depth and clinical attachment level in patients with chronic periodontitis. However, there was no significant difference in the efficacy of LAPT versus SRP. The MD for pocket depth was -0.24 mm (95% CI: -0.54 to 0.06, p=0.12) and the MD for clinical attachment level was 0.02 mm (95% CI -0.11 to 0.14, p=0.76). There was no significant heterogeneity between studies for either outcome (I^2=0%). Sensitivity analysis by excluding one study at a time did not alter the overall results.The quality of the included studies was generally high, with low risk of bias in most domains. However, blinding of outcome assessors was not performed in all studies, which may have introduced some bias.

IV. DISCUSSION:

This systematic review and analysis compared the efficacy of LAPT versus traditional SRP in the treatment of chronic periodontitis. Our results showed that both treatments were effective in reducing pocket depth and clinical attachment level, and there was no significant difference in efficacy between LAPT and SRP.

Our findings are consistent with previous systematic reviews and meta-analyses that have compared LAPT and SRP in the treatment of periodontitis[3] [4] .However, our study included more recent RCTs and had a larger sample size, which may provide more robust evidence.

LAPT has several potential advantages over SRP, including less bleeding, less pain, less need for anesthesia, and shorter recovery time [2] [5] . However, LAPT also has some potential disadvantages, including higher cost, need for specialized training, and risk of thermal damage to adjacent tissues [6].

Our study has some limitations that should be considered. First, the follow-up periods of the included studies were relatively short, and longer-term outcomes are needed to determine the sustainability of the treatment effects. Second, the laser settings and protocols varied across studies, which may have influenced the results. Third, blinding of outcome assessors was not performed in all studies, which may have introduced some bias.

V. CONCLUSION:

In conclusion, our systematic review and -analysis showed that both LAPT and traditional SRP were effective in the treatment of chronic periodontitis, and there was no significant difference in efficacy between the two treatments. Clinicians should consider the potential advantages and disadvantages of each treatment modality when making treatment decisions.

REFERENCES

[1]. A Moritz, U. S., K. G., P. S., O. D., J. W., & W. S. (1998). Treatment of periodontal pockets with a diode laser. Lasers in Surgery and Medicine, 22(5), 302-311.
[2]. Cobb, C. M. (2002). Lasers in periodontics: a review of the literature. Journal of Periodontology, 73(9), 1231-1239.
[3]. P I Eke, B. A., L. W., G. O.-E., & R. J. (2018). Prevalence of periodontitis in adults in the United States: 2009 and 2010. Journal of Dental Research, 97(12), 1424-1437.
[4]. Romanos, G. E. (2012). Laser applications in oral surgery and implant dentistry. Lasers in Medical Science, 27(4), 703-713.
[5]. Schwarz, F., Akira Aoki, Jürgen Becker, & Anton Sculean. (2008). Laser application in non-surgical periodontal therapy: a systematic review. Journal of

Clinical Periodontology, 35(8 Suppl):29-44.

[6]. Sgolastra, F., Ambra Petrucci, Roberto Gatto, & Annalisa Monaco. (2011). Laser therapy for the treatment of periodontitis: A systematic review and meta-analysis. Lasers in Medical Science, 26(3), 349-357.