INTISARI

Perawatan ortodonti memiliki durasi waktu yang lama sehingga berpotensi menimbulkan beberapa efek samping seperti resesi gingiva, resorbsi akar, dan karies. Berbagai metode telah dikembangkan untuk mempersingkat durasi perawatan ortodonti salah satunya dengan metode fisik. *Low-level laser therapy (*LLLT) dan vibrasi mekanis merupakan contoh metode fisik yang telah berkembang di masyarakat. *Low-level laser therapy* merupakan terapi yang menggunakan sinar laser berkekuatan rendah untuk menstimulasi reaksi biologis pada jaringan. Vibrasi mekanis merupakan teknik yang memanfaatkan aplikasi gaya dinamis secara biomekanik sebagai biostimulator terhadapjaringan. Narrative review ini bertujuan untuk membandingkan efektivitas (LLLT) dan vibrasi mekanis dalam mempercepat pergerakan gigi secara ortodonti.

Pencarian literatur dilakukan pada database Pubmed, SAGE Journals, Science Direct, Wiley Online Library, dan Google Scholar dengan kata kunci *orthodontics, tooth movement, tooth movement techniques, low-level light therapy, low-level laser therapy, rate, accelerate, acceleration, accelerating, velocity, speed,* dan *vibration*. Artikel diseleksi menggunakan kriteria inklusi dan eksklusi. Total artikel yang digunakan sebanyak 30 artikel.

Low-level laser therapy terbukti lebih efektif dibandingkan dengan vibrasi mekanis dalam meningkatkan kecepatan pergerakan gigi secara ortodonti. *Low-level laser therapy* dapat meningkatkan pergerakan kaninus dan penutupan ruang pasca ekstraksi premolar pertama, menurunkan durasi perawatan leveling dan alignment, meningkatkan pergerakan gigi dan jumlah tulang interseptal pada uji *in vivo,* serta meningkatkan biomarker remodeling tulang seperti IL-1 beta, PGE2, dan RUNX2. Efektivitas vibrasi mekanis dalam meningkatkan kecepatan pergerakan gigi secara ortodonti tidak memiliki bukti pendukung yang kuat dan temuan dari studi terdahulu bersifat kontradiktif.

Kata Kunci: LLLT, vibrasi mekanis, mempercepat perawatan ortodonti

ABSTRACT

Orthodontic treatment has a long duration thus it has the potential to cause several side effects such as gingival recession, root resorption, and caries. Various methods have been developed to shorten the duration of orthodontic treatment, one of which is the physical method. Low-level laser therapy (LLLT) and mechanical vibration are examples of physical methods that have developed in society. Low-level laser therapy is a therapy that uses low-power laser light to stimulate biological reactions in tissues. Mechanical vibration is a technique that uses the application of dynamic force in biomechanics as a biostimulator to the tissues. This narrative review aims to compare the effectiveness of LLLT and mechanical vibration in accelerating orthodontic tooth movement.

Literature searches were carried out on Pubmed, SAGE Journals, Science Direct, Wiley Online Library, and Google Scholar with the keywords orthodontics, tooth movement, tooth movement techniques, low-level light therapy, low-level laser therapy, rate, accelerate, acceleration, accelerating, velocity, speed, and vibration. Articles were selected using inclusion and exclusion criteria. The total articles used were 30 articles.

Low-level laser therapy has been shown to be more effective than mechanical vibration in increasing the speed of orthodontic tooth movement. Low-level laser therapy can increase canine movement and space closure after first premolar extraction, decrease the duration of leveling and alignment, increase tooth movement and the number of interseptal bone in *in vivo* tests, and increase bone remodeling biomarkers such as IL-1 beta, PGE2, and RUNX2. The effectiveness of mechanical vibration in increasing the speed of tooth movement orthodontically does not have strong supporting evidence and the findings of previous studies are contradictory.

Keywords: LLLT, mechanical vibration, accelerate orthodontic treatment