

## Influence of Three Distinct Wavelengths of Photobiomodulation on the Rate of Accelerated Orthodontic Tooth Movement and Interleukin-6 Levels

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### Abstract

**Objective:** To evaluate the effect of intra oral photo biomodulation appliance with three distinct wavelengths 740,850 & 940nm on the rate of accelerated orthodontic tooth movement (OTM) and the production of Interleukin-6 (IL-6).

**Methods:** Thirty patients 15 males and 15 females (aged 13-28 years),10 patient each Formed Group A, B and C respectively, underwent photo biomodulation therapy with 3 different wavelengths of 740,850 & 940 nm. The split-mouth technique involved designating the 1st and 3rd quadrants as experimental and the 2nd and 4th quadrants as control, with crowding reduction measured both pretreatment and after a duration of three months. The rates of OTM and levels of IL-6 were measured using microcapillary pipettes on the initial day (D0), the 21st day (D21), and the 81st day (D81).

**Results:** All the three groups showed statistically significant difference, pretreatment, at 3 months duration in the mean OTM value, and IL-6 levels at different time period.

**Conclusions:** The rate of OTM, as compared to pre-treatment and after three months, was statistically significant across all three groups, with IL-6 levels being highest in patients from Group A on Day 21, followed by Groups B and C on Day 81, respectively. Photobiomodulation resulted in elevated IL-6 levels and expedited orthodontic tooth movement (OTM).

### Keywords

Accelerated orthodontics, Interleukin-6, Light emitting diode, Orthodontic tooth movement, Photobiomodulation.