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# Assessment of photobiomodulation therapy by an 810-nm diode laser on the reversal of soft tissue local anesthesia in pediatric dentistry: a preliminary randomized clinical trial

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## Abstract

During the injection of local anesthesia in pediatric dental procedures, from the injection time until the elimination of tissue anesthesia, inevitable problems were reported. According to the encouraging results of previous studies addressing the positive effects of laser therapy on increasing the microcirculation, we aimed to investigate the clinical effect of photobiomodulation therapy on the reversal of soft tissue anesthesia in children. Using a split-mouth design, 34 children aged 4 to 8 years old, candidate for receiving local infiltration injection at both right and left side in mandible, were enrolled in the study. The mandibular right and left quadrants were randomly assigned to groups of laser or sham laser: in laser side, patients received 810-nm laser irradiation, and in the sham laser group, the patients had the laser in off mode at 45 min after injection with an interval of 7-10 days between two sessions of each quadrant treatments. The degree of anesthesia was evaluated using the palpation technique alternately every 15 min. Data were analyzed using paired sample t test and multiple linear regression test. The mean duration of anesthesia expressed in minutes was equal to 145.15 ± 23.27 and 188.82 ± 12.31 for the laser group and sham laser group, respectively. There was a significant difference in duration of anesthesia between two groups ($P < 0.001$). Considering the results and limitations of the present study, photobiomodulation therapy by 810-nm diode laser can be proposed as a non-invasive method in order to reduce the duration of anesthesia in pediatric patients.

**Keywords:** Children; Dentistry; Laser; Local anesthesia.

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