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### A Comparison of the Shear Bond Strength of Orthodontic Brackets Bonded With Light-Emitting Diode and Halogen Light-Curing Units

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#### Abstract:

Statement of the problem: Various methods such as light emitting diode (LED) have been used to enhance the polymerization of resin-based orthodontic adhesives. There is a lack of information on the advantages and disadvantages of different light curing systems. Purpose: The aim of this study was to compare the effect of LED and halogen light curing systems on the shear bond strength of orthodontic brackets. Materials and Methods: Forty extracted human premolars were etched with 37% phosphoric acid and cleansed with water spray and air dried. The sealant was applied on the tooth surface and the brackets were bonded using Transbond adhesive (3M Unitek, Monrovia, Calif). Adhesives were cured for 40 and 20 seconds with halogen (Blue Light, APOZA, Taiwan) and LED (Blue dent, Smart, Yugoslavia) light-curing systems, respectively. Specimens were thermocycled 2500 times (from 5 to 55 ° C) and the shear bond strength of the adhesive system was evaluated with an Universal testing machine (Zwick GmbH, Ulm, Germany) at a crosshead speed of 1 mm/min until the brackets were detached from the tooth. Adhesive remnant index (ARI) scores were determined after bracket failure. The data were submitted to statistical analysis, using Mann-Whitney analysis and t-test. Results: No significant difference was found in bond strength between the LED and halogen groups (P=0.12). A significant difference was not observed in the adhesive remnant index scores between the two groups (P=0.97). Conclusion: Within the limitations of this in vitro study, the shear bond strength of resin-based orthodontic adhesives cured with a LED was statistically equivalent to those cured with a conventional halogen-based unit. LED light-curing units can be suggested for the polymerization of orthodontic bonding adhesives.

#### Keywords:

[Light emitting diode](#) , [Orthodontic bracket](#)

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