



DOI: <http://dx.doi.org/10.21270/archi.v6i0.2255>

Zer-001

Effect of photodynamic therapy on the mechanical properties of intraradicular dentin

Sahyon, HBS¹, Silva PP², Oliveira MS², Silva PZ², Gallego J³, Cintra LTA², Dos Santos PH¹, Sivieri-Araujo G²

¹São Paulo State University (UNESP), School of Dentistry, Araçatuba, Department of Dental Materials and Prosthodontics

²São Paulo State University (UNESP), School of Dentistry, Araçatuba, Department of Restorative Dentistry

³São Paulo State University (UNESP), School of Natural Sciences and Engineering, Ilha Solteira, Department of Mechanical Engineering

The use of photosensitizers in photodynamic therapy promotes microbial reduction, with antibacterial effect intra-root canal. However, there are no studies evaluating the consequences of the application of these agents on the mechanical properties of root dentin. The purpose of this *in vitro* study was to evaluate the influence of photodynamic therapy on the mechanical properties (Martens hardness and elastic modulus) in intra-root dentin applying the curcumin and methylene blue photosensitizers. Forty bovine teeth were sectioned 1mm above the cementum-enamel junction. The biomechanical instrumentation in all root canals was performed and the teeth were distributed into 5 groups (n=8). G1 – Control (deionized water); G2 – Methylene blue 50 mg/L + red Laser; G3 – Methylene blue 100 mg/L + red Laser; G4 – Curcumin 500 mg/L + blue Led and G5 – Curcumin 1000 mg/L + blue Led. The mechanical properties (Martens hardness and elastic modulus) were measured in a DUH-211 digital ultra-microhardness tester (Shimadzu), under load of 3mN (n=8). The data of mechanical properties were subjected to statistical tests of normality and analyzed by Kruskal-Wallis test ($\alpha=0.05$). The data showed that the mechanical properties of Martens hardness and elastic modulus of intra-root dentin are influenced by the photosensitizers. The use of curcumin photosensitizer showed, in general, lower values of the mechanical properties. The photosensitizers employed were able to influence the mechanical properties, and the methylene blue 50 mg/L photosensitizer showed, in general, promising results, suggesting that it could be used in photodynamic therapy without causing significant interference in the mechanical properties of dentin adequate light intensity to allow satisfactory mechanical properties of resin materials.

Descriptors: Dentin; Hardness Tests; Elastic Modulus.