عنوان مقاله:

An Invitro Study on The Temperature Changes of Dentin, Irradiated by CO۲ and Er : Cr;YSGG Laser

محل انتشار:

مجله لیزر در علوم پزشکی, دوره 1, شماره 1 (سال: 1389)

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Abstract INTRODUCTION : The aim of this in-vitro study was the evaluation of mperature changes due to irradiation of two different lasers used for the reduction of dentinal hypersensitivity and their effect on the pulp damage. The study was done for two dentin thicknesses. METHODS : Twenty intact extracted third molars were prepared by longitudinal ground sectioning for ۱ and ۲ mm dentin thicknesses while a thermocouple was positioned at the inner surface of the dentin disk. Thermal evaluation was assessed by a KJT digital thermometer. During the test, the data produced by the thermometer was transferred and logged into a PC via RS۲۳۲ serial port. CO۲ laser (Ultra pulse,۵۰W, ۱۰۰?sec, Spot size : ۰.۵ mm) and Er,Cr;YSGG laser (Free-running pulse mode,۰.۲۵W, ۱۴۰?sec, ۱۲.۵۰ milli-joules) irradiations were randomly performed upon the dentin surfaces. The collected data was analyzed by two-way ANOVA test.RESULTS : The mean temperature rise in ۱mm dentinal thickness was ۸.۵۷℃ which was significantly higher than ۳.۶۳℃ in ۲mm dentin thickness (P<۰.۰۰۱) and higher than the threshold temperature for pulp damage; however, no significant difference was noted between the two lasers (P=۰.۳۵۵). After removing the CO۲ laser, the temperature decreased to the initial level faster than the time needed for Er,Cr;YSGG laser (۴۴.۴۷℃versus ۶۲.۸۲℃)(P<۰.۰۰۱). In other words, in both lasers the temperature decrease in ۲mm dentinal disc was faster than ۱mm dentinal disc.CONCLUSION : The temperature rise due to both lasers for ۱mm of dentinal thickness was in excess of safe limit for the tissue and it would probably result in pulpal damage.In the case of ۲mm dentinal thickness, the temperature rise was not higher than the safe limit and it would not damage the pulp in clinical conditions.

Keywords : Dentin Temperature Co۲ lasers Er Cr YSGG Dental pulp Dentin Sensitivity

کلمات کلیدی:

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