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Abstract

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The aim of this study was to evaluate the ability of endotoxin to diffuse through dentinal tubules towards the cement and to observe the period of time needed for it to reach the external root surface. Thirty single-rooted human teeth had their crowns and apices removed in order to standardize the root length to 15 mm. Teeth were instrumented until #30 K-file and made externally impermeable with epoxy adhesive, leaving 10 mm of the exposed root (middle third). The specimens were placed in plastic vials and irradiated (60Co gamma-rays). Then, they were divided into 2 groups (n = 15): G1) *Escherichia coli* endotoxin was inoculated into the root canal of the specimens and 1 ml of pyrogen-free water was put in the tubes; G2) (control): pyrogen-free water was inoculated into the root canals and 1 ml of pyrogen-free water was put in each tube. After 30 min, 2 h, 6 h, 12 h, 24 h, 48 h, 72 h and 7 days, the water of the tubes was removed and replaced. The removed aliquot was tested for the presence of endotoxin. Considering that the endotoxin is a B-lymphocyte polyclonal activator, at each experimental period, B-lymphocyte culture was stimulated with a sample of water removed from each tube and antibody (IgM) production was detected by ELISA technique. The results of IgM production were higher in groups of 24 h, 48 h, 72 h and 7 days in relation to the other studied groups, with statistically significant differences (ANOVA and Tukey's test $p < 0.05$). Endotoxin was able to diffuse through the dentinal tubules towards the cement, reaching the external root surface after the period of 24 h.

Keywords : Endotoxins; Tooth permeability; Dentin; Root canal.

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