Abstract:

Title: Comparative evaluation of antimicrobial activity of three types of reinforced zinc oxide eugenol used for pulpotomy in primary teeth.

Introduction: One of the major purposes of pediatric dentistry is to maintain primary teeth in anatomical and functional conditions up to their physiological exfoliation and eruption of permanent teeth. Whenever pulp gets involved or exposed to mouth area and microorganisms penetrate in to pulp, primary tooth needs pulp treatment. In the sterile environment, the pulp tissue is able to repair itself and also to create a dentin bridge, while in the presence of bacteria, disease and ultimately death of the pulp is inevitable. The ideal pulpotomy cement should have good physical and biological properties such as sealing of the remaining pulp tissue, being biocompatible and presenting antibacterial activity. The aim of this study was to compare the antibacterial effect of some usual materials used for pulpotomy in primary teeth.

Materials and Methods: In this study, the antibacterial activity of materials used in primary teeth pulpotomy include Zoliran, Sina Zonalin, Kemdent Zonalin, MTA (OrthoMTA) and Cem Cement was evaluated against Streptococcus mutans and Lactobacillus acidophilus. Well diffusion test and disk diffusion test and time kill curve were used for antibacterial activity assay. Also stability of materials antibacterial activity was evaluated. The antibacterial activity in disk diffusion and well diffusion test was measured based on the diameter of the zone of inhibition formed, whereas in time kill curve the optical density of the bacterial suspension was measured.

Results: In Well diffusion test and disk diffusion test all of the materials except Cem Cement show antibacterial activity against Streptococcus mutans and Lactobacillus acidophilus. The largest zone of inhibition formed belongs to zoliran and the least one is MTA ($P \leq 0.05$). In method of time kill curve, conclusion was the same pattern. As in a period of time Zoliran, Sina Zonalin, Kemdent Zonalin, MTA and Cem Cement have the greatest effects in both groups of bacteria respectively ($P \leq 0.05$).

Conclusion: Reinforced ZOE groups has the greatest potential of inhibition against S.mutans and L.acidophilus by comparison to MTA and Cem Cement. Thus, using of Zoliran, Sina and Kemdent Zonalin cements in pulpotomy of primary teeth can create useful effect on controlling bacterial growth and success in pulpotomy.

Keywords: antimicrobial activity, reinforced ZOE, MTA, Cem Cement, pulpotomy, primary teeth.