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Evaluation of surface analysis of Gutta Percha after disinfecting with sodium hypochlorite, silver nanoparticles and chitosan nanoparticles by atomic force microscopy: An *in vitro* study

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Aims & objectives: The purpose of this study is to evaluate the surface topography of gutta percha (GP) after disinfecting with Sodium hypochlorite (5.25%), Silver nanoparticles (70 µg/ml) and chitosan nanoparticles (1.5 mg/ml) by atomic force microscopy (AFM).

Materials and methods: Forty (40) Gutta percha cones were taken in this *in vitro* study. These samples were divided into four different groups such as: Group I – control group (untreated GP Points), Group II, III, and IV were treated with 5.25% Sodium hypochlorite (NaOCl), 70 µg/ml silver nanoparticles (AgNPs) and 1.5 mg/ml Chitosan nanoparticles (ChNPs) respectively. The surface topography analysis of the samples was performed using AFM.

Statistical analysis: Root mean square (RMS) and surface roughness parameters were used to compare the structure of GP points with contact mode imaging. These values were tested by IBM SPSS-20.0 version statistical software using one-way ANOVA and Post-hoc (Tukey HSD) tests. They were considered statistically significant when $P < 0.05$.

Results: The Root mean square (RMS) and surface roughness values are significantly higher for Sodium hypochlorite group (5.25% NaOCl) when compared with silver nanoparticles group (70 µg/ml AgNPs) and Chitosan nanoparticles group (1.5 mg/ml ChNPs).

Conclusion: This study has shown more surface topography deterioration of GP treated with NaOCl and lesser deterioration with AgNPs and ChNPs which affects postoperative prognosis.

Biography

Chavva Lakshmi Charan Reddy is highly motivated, skilful clinical professional with a passion for endodontic and aesthetic management of teeth. Completed the BDS (2012-2017) from Mamata dental college, Khammam, Telangana and MDS (2018-2021) from Panineeya dental college, Hyderabad, Telangana. Passed the MDS with distinction (University fourth). Won the best poster at 3rd APTS IACDE conference and best paper at IACDE 2nd zone PG convention. Had 12 publications in various national and international journals. His fields of interest for research is endodontic retreatment and surgical endodontics.

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