

## ABSTRACT

**AIM:** To evaluate the anti *E. faecalis* efficacy and depth of penetration of curcumin modified sealer using Confocal Laser Scanning Microscope (CLSM).

**METHODOLOGY:** According to a previously described protocol 45 single rooted teeth were swlwcted and sectioned into 90 semi cylindrical halves were fractured and shaped into 4x4x2 mm in size. *E. faecalis* inoculation was done by centrifugation process and inoculated for 3 weeks for biofilm formation. After that the 90 infected dentin halves with 3 week old *E. faecalis* biofilms were randomly allocated to 2 major groups. Group 1 (n=45) is zinc oxide eugenol (ZOE) and group 2 (n=45) is curcumin modified MTA sealer (MTAC). Sealer was placed on the dentin surface of root canal wall. All dentin samples were placed in 100% humidity for 7,21,45 days (n=15) after which the sealer was scraped off. LIVE/DEAD backlight bacterial viability staining containing Fluorescein diacetate (FDA) and Propidium Iodide (PI) was used to stain the specimens and viewed under CLSM. The relative area percentage of red fluorescence to added (green and red) fluorescence indicated the proportion of killed cells.

30 maxillary single rooted teeth was selected and decoronated and prepared upto F3 protaper. F3 master cone was selected and sealers were mixed with rhodamine B dye and then obturated and divided into 2 groups, Group 1 (n=15) zinc oxide eugenol (ZOE) & Group 2 (n=15) curcumin modified MTA sealer (MTAC). After obturation, 2mm thick cross section from the apical section of the root was taken and analysed under CLSM for depth of penetration.

**RESULTS:**

**DEPTH OF PENETRATION:**The results of the present study showed that the curcumin modified MTA sealer (MTAC) had significant greater depth of penetration than ZOE. (p value is  $<.05$ ;unpaired t test).

#### **ANTI E.FAECALIS EFFICACY**

The results of the present study showed that there was significantly greater anti bacterial efficacy at 7 days for ZOE than MTAC. There was significantly greater anti bacterial efficacy at 21 days for ZOE than MTAC (p value $<0.05$ ;unpaired t test). During 45 days time period , there was significantly greater anti bacterial efficacy for MTAC than ZOE.(p value $<0.05$ ;unpaired t test).

#### **Zinc Oxide Eugenol Group (ZOE)**

When comparing within groups there was no statistical significant difference between 7 days and 21 days.(p value  $>0.05$ ;unpaired t test).The 21 days group showed significantly greater anti bacterial efficacy when compared to 45 days.(p value $<0.05$ ). The 7 days group showed significantly greater anti bacterial efficacy when compared to 45 days group.(p value $<0.05$ ).

#### **Curcumin modified MTA sealer Group (MTAC)**

When comparing within groups, there was no statistically significant difference between 7 days, 21 days and 45 days though the mean score showed difference.(p value $>0.05$ ;unpaired t test).

#### **CONCLUSION:**

The findings of the present study can be summarized as follows.

- 1) Regarding anti bacterial efficacy against E.faecalis there was no statistically significant difference for MTAC at 7, 21 and 45 days. While ZOE showed statistically significant decrease in antibacterial efficacy through out the time period from 7to 45 days.
  
- 2) The MTAC group showed greater depth of penetration at the apical third of the canal than ZOE group.

**KEYWORDS:** Confocal laser scanning microscopy,Enterococcus faecalis, curcumin modified MTA sealer.