39th IACDE National Conference

IMPACT OF DIFFERENT IRRIGATING REGIMENS ON SMEAR LAYER REMOVAL AND DENTIN MICRO HARDNESS : A COMPARITIVE STUDY WITH AND WITHOUT LASERS

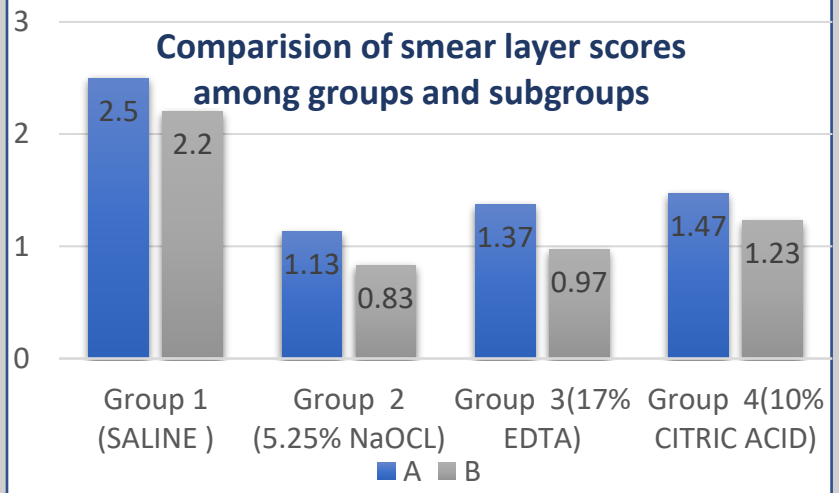
BACKGROUND: **Removing the smear layer and preserving dentin are essential for successful root canal therapy. Irrigants like NaOCl, EDTA, and citric acid clear organic and inorganic debris and affect dentin micro hardness, key to tooth integrity. Nd:YAG laser activation boosts irrigant effectiveness, enhancing smear layer removal and tubule penetration.**

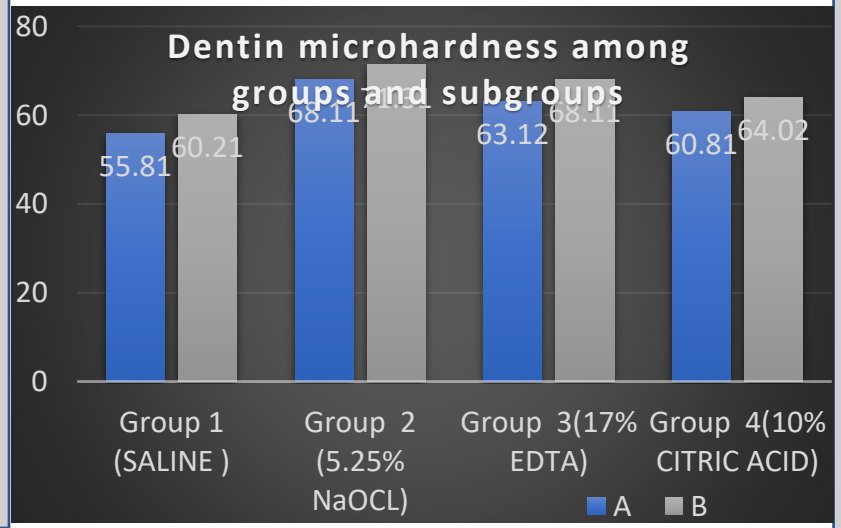
AIM

This study compared the effectiveness of various irrigating solutions 5.25% NaOCl, 17% EDTA, and citric acid with and without laser activation in removing smear layers and preserving dentin microhardness during root canal treatment.

MATERIALS & METHODOLOGY

- Selection of teeth :60 single rooted teeth
- Preperation of access cavities and determination of working length
- Grouping: 4 groups (saline, NaOCl, EDTA, Citric acid)Two subgroups (with/without Laser)
- Irrigation protocol: Apply solution for 5 minutes and Laser for 20 seconds
- smear layer assessment by SEM 500 x and Dentin microhardness by Vickers test.





DISCUSSION:

- **Results revealed that laser activation significantly enhanced smear layer removal and tubule penetration, indicating its potential to boost the performance of traditional irrigants.**
- **However, the impact on dentin microhardness varied depending on the irrigant used, with some solutions causing more reduction than others.**
- **This emphasizes the need to balance smear layer removal and dentin integrity in clinical practice.**

CONCLUSION:

All the irrigants showed significant reduction of smear layer and aletered the dentin microhardness.

- **5.25% NaOCl with laser activation showed better smear layer removal compared to EDTA & citric acid**
- **5.25% NaOCl with laser activation showed less alteration in dentin microhardness followed by 17% EDTA & 10% Citric acid.**
- **Lasers significantly improved the smear layer removal and maintenance of dentin microhardness in all groups.**

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