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COMPARE AND EVALUATE THE EFFECTIVENESS OF CHEMO MECHANICAL CARIES REMOVAL AGENTS: BRIX 3000 AND CARIE FIX IN REMOVING INFECTED DENTIN IN PRIMARY MOLARS- AN IN-VITRO STUDY

By

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Dissertation Submitted to the
Shri Dharmasthala Manjunatheshwara University, Dharwad, Karnataka,

In partial fulfilment
of the requirements for the degree of

MASTER OF DENTAL SURGERY (M.D.S)

In

PEDIATRIC AND PREVENTIVE DENTISTRY

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2020- 2023

ABSTRACT

Background

Caries is a multifactorial disease which is caused by an imbalance in the demineralization and remineralization processes on dental hard tissues, and this imbalance might lead to progressive tooth destruction. Selective removal of carious dentin must be performed, considering not only healthy tissue preservation but also the minimization of painful stimuli. The newly introduced CARIE FIX gel, a papain-based gel which helps in nontraumatic removal of dental caries by the chemo mechanical method. More recently then in 2016 (in Latin America), a new papain-based agent (Brix 3000) was introduced to the market, with major composition difference and It involves an enzymatic activity (3.000 U/mg) in which the papain is bio-encapsulated by using EBE Technology (Encapsulating Buffer Emulsion) that immobilizes and confers stability.

Objective

to evaluate and compare the efficacy of CMCR agents BRIX 3000, CARIE FIX in removing infected dentin on primary molar teeth.

Methodology

in vitro study was done involving 20 extracted primary molar teeth with moderate to deep dentinal caries not involving pulp. Sectioning of tooth was done mesiodistally into two halves. 20 sectioned teeth were applied with BRIX 3000 gel and 20 sectioned teeth with CARIE FIX. Removal of carious dentine was continued until the gel was no longer observed cloudy. After we see the cloudy appearance on tooth surface, the gel was then removed and the cavity was wiped with a moistened cotton pellet and rinsed.

BRIX3000 and CARIE FIX were applied with a blunt spoon excavator allowing it to work for 3-4 mins. The time was noted with the help of stopwatch. Once the applied gel turned turbid, it was removed by using spoon excavator.Each sample was then washed with distilled water and placed in 2.5% glutaraldehyde in 0.1 M phosphate buffer (pH 7.4) for 24 hours. The samples were then be washed and dehydrated in a 70% ethyl alcohol (for 10 mins each). After washing all the samples, each sample was dried for 15 minutes each.

The Scanning electron microscopic study was done in Shivaji University, Kolhapur. The specimens were mounted on aluminium stubs with the help of carbon tape for gold sputter coating.

After the vacuum is created in the vessel, surfaces of the remaining dentin were examined with focussed under Scanning electron microscope under the magnification of X9000 (Joel S6360, TOKYO, JAPAN at 18 KV, and images were taken to analyze the presence or absence of bacterial deposits or smear layer in primary dentin after caries excavation in both groups.

Results

After the statistical analysis we saw as BRIX 3000 took an average time of 2mins 50 secs and CARIE FIX took an average time of 3 mins 20 secs, so BRIX 3000 showed better time efficiency in caries removal after the gel application. In our study presence of bacterial deposits were seen only in 4 out of 20 samples with CARIE FIX and 3 out of 20 with BRIX 3000.

The smear layer was removed completely in 15 out of 20 samples with CARIE FIX and 17 out of 20 samples with BRIX 3000.

Conclusion

It was concluded that BRIX 3000 proved to be more effective than CARIE FIX but both CMCR techniques with BRIX 3000 and CARIE FIX were considered an effective method of caries removal as it preserves the sound tooth structure and is highly useful in very fearful and anxious patients so it can bring promising results in Pediatric, as well as special health care need patient.

Keywords: primary teeth, chemo mechanical caries removal, caries excavation, infected dentin, sound dentin, scanning electron microscope.