DENSITY OF SDF-TREATED ENAMEL AND DENTINE: *IN VITRO STUDY*

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Background

The use of silver diamine fluoride (SDF) in minimally invasive dentistry provides a safe, effective, and accessible method for the treatment and prevention of caries lesions; it is a harmless, transparent substance with cariostatic, re-mineralizing, anti-enzymatic and desensitizing properties, despite the staining of the affected tissues, the properties of this substance are favorable.

Purpose

The aim of this project was to evaluate the structural changes produced by 38% silver diamine fluoride in sound and decayed enamel-dentine.

Methods

This *in vitro study* was performed using four groups of teeth with sound and decayed both structures.

Fig. 1. Samples mounted on silicone

Cone Beam Planmeca Promax 3D Mid Proface tomograph was used to evaluate the density in Hounsfield units (HU) (Fig. 2)

Fig 2. Cone Beam Planmeca Promax 3D mid proface tomograph

To standardize the area evaluated and ensure analysis of the same site immediately and at two months, the mean HU of the samples obtained from an area of 0.64mm² (0.8mm long x 0.8mm wide) were taken into account and measured in the areas where the lesions were clinically observed. (Fig. 3 and Fig. 4).

Fig. 3. Initial UH of a healthy enamel with treatment.

Fig. 3. UH at two months, of a healthy enamel with treatment.

Results

After comparing the results, groups that showed significant differences of Hounsfield units were healthy dentin with immediate SDF with a difference of **372.77 HU**, carious dentin with immediate SDF showing a difference ($p < 0.05$) of **546.74 HU**, after two months, the results of carious enamel with SDF had a difference of **460.99 HU** and carious dentin with SDF showed a difference of **572.22 HU.**

			Statistics	Gl	P
without initial treatment sound dentine	SDF after two months	Student's T	-7.63	3.00	0.005
without initial treatment decayed enamel	SDF after two months	Student's T	-3.64	3.00	0.036
without initial treatment decayed dentine	SDF after two months	Student's T	-8.54	3.00	0.003

Table.1. T-tests for Paired Samples showing statistically significant differences ($p \leq 0.05$) were: healthy dentine with SDF, carious enamel with SDF, and carious dentine with SDF.

Conclusion

The use of SDF increases the density of healthy dentine, carious dentine, and carious enamel with treatment at two months of observation.

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