

COMPARATIVE ASSESSMENT OF REMINERALISATION OF TOOTH ENAMEL, DEMINERALISED BY ACIDIC SOFT DRINK USING 2 COMMERCIALY AVAILABLE NON-FLORIDATED REMINERALISING TOOTH PASTES – INVITRO STUDY

Dentistry

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ABSTRACT

A number of various formulations of dentifrices exist in the market. There is a big concern of fluoride ingestion with the toothpaste containing high fluoride content in children. Carbonated Soft drinks, have been suggested as causing damage to the teeth bring about demineralization leading to dental caries. Therefore, the present study has been undertaken to assess and compare the remineralization potential of two non fluoridated dentifrices with different compositions on tooth enamel in vitro by using surface profilometer

KEYWORDS

Non fluoridated, carbonated drinks, caries, demineralisation, re-mineralisation, Anticay technology, Novamin technology, Profilometer.

INTRODUCTION

Different formulations of dentifrices exist in the market. Usually, single toothpaste is used by all family members including children.¹ There is a big concern of fluoride ingestion with the toothpaste containing high fluoride content in children.¹

Carbonated Soft drinks, excluding milk and water, have been suggested as causing damage to the teeth for two reasons. Firstly, the low pH and high titratable acidity of some drinks may lead to erosion of enamel surface.²

Secondly the sugars in drinks are metabolized by plaque microorganisms to generate organic acids that bring about demineralization leading to dental caries²

Recently, new toothpastes with remineralization potential without fluoride content Using anticay technology and Novamin technology has been formulated¹

There is an urgent need to compare remineralization potential of these non fluoridated new formulations.

Therefore, the present study has been undertaken to assess and compare the remineralization potential of two dentifrices with different compositions on tooth enamel in vitro by using surface profilometer.

AIM

To evaluate and compare the remineralisation potential of 2 commercially available non fluoridated remineralising tooth pastes on incisors after exposure to an acidic softdrink.

OBJECTIVE OF THE STUDY

- To evaluate the remineralisation potential of 2 commercially available non fluoridated remineralising tooth pastes on incisors after exposure to an acidic softdrink.
- To compare the remineralisation potential of 2 commercially available non fluoridated remineralising tooth pastes on incisors after exposure to an acidic softdrink.

MATERIALS AND METHODOLOGY

- 20 extracted incisors selected as per inclusion criteria (Extracted maxillary and mandibular incisors teeth were collected, disinfected and stored in 10% formalin for the study.)
- Acidic soft drink (Coca-Cola) pH 2.6-2.7
- Shy NM remineralising toothpaste
- Toothmin remineralising toothpaste
- Acrylic blocks to mount the crown of tooth with labial surface exposed.

Type Of The Study: An In-Vitro Study.

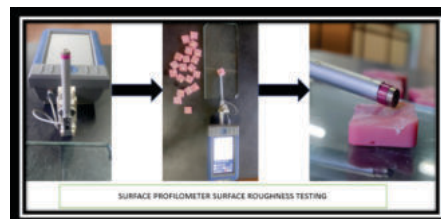
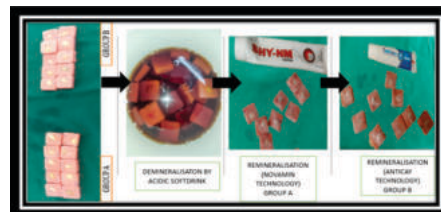
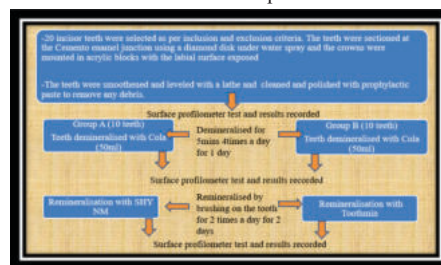
- Source:** Samples (maxillary and mandibular extracted incisors) were collected from dental clinics and hospitals patients who were seeking extraction due to periodontal problems and due to caries not involving the crown.

Inclusion Criteria

- Extracted maxillary and mandibular incisor teeth with mature apices.
- Extracted maxillary and mandibular incisor teeth with intact enamel

Exclusion Criteria

- All Multi-rooted Teeth
- Teeth With crown fractures
- Teeth With Developmental Defects.
- Endodontically Treated Teeth.
- Teeth With External/Internal Resorption.



Statistical Analysis

Sample Size Estimation

Based on a previous study on Remineralisation Potential of Three Toothpastes on enamel by Rajnish K Singhal et.al, using G-Power (3.1.9.7) software, the sample size was calculated as 10 per group.

Total Sample size = 20 teeth

α – error 0.05 (95% confidence interval)

Result Analysis

The data that was entered on the excel sheet was transferred to IBM Statistical Software for Social Science (SPSS) Software version 21.00. The data was checked for normality using Kolmogorov-Smirnov test. The results showed that the data followed normal distribution. The p value was less than 0.05 is statistically significant.

RESULTS

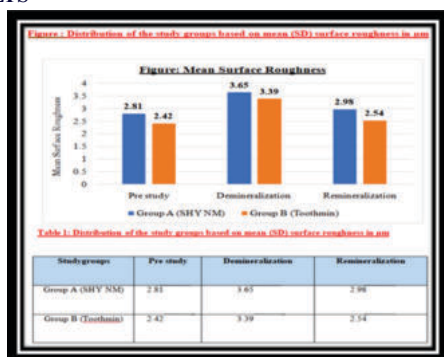


Table 2: Comparison between the mean surface roughness in μm of the study groups using Student's t test

		Mean	df	t Value	p Value
Pre study	SHY NM	2.81	9	0.78	0.22 (NS)
	Toothmin	2.43	9		
Demineralization	SHY NM	3.65	9	0.65	0.26 (NS)
	Toothmin	3.40	9		
Remineralization	SHY NM	2.98	9	0.89	0.19 (NS)
	Toothmin	2.55	9		

NS: Not Significant at p value less than 0.05 (Student's t test)

Table 3: Comparison of mean surface roughness in μm before and after the remineralization with SHY NM tooth paste using Paired t test

		Mean	t Value	df	p Value
Pair 1	Pre study and Demineralization	-0.83	-3.46	9	0.00 (S)
Pair 2	Demineralization and Remineralization	0.67	2.89	9	0.01 (S)
Pair 3	Pre study and Remineralization	-0.16	-1.60	9	0.14 (NS)

Pair 1 and pair 2 are statistically significant at p value less than 0.05 (Paired t test).

Table 4: Comparison of mean surface roughness in μm before and after the remineralization with Toothmin tooth paste using Paired t test

		Mean	t Value	df	p Value
Pair 1	Pre study and Demineralization	-0.96	-6.25	9	0.00 (S)
Pair 2	Demineralization and Remineralization	0.84	5.09	9	0.00 (S)
Pair 3	Pre study and Remineralization	-0.12	-4.51	9	0.00 (NS)

Pair 1, Pair 2 and Pair 3 are statistically significant at p value less than 0.05 (Paired t test).

DISCUSSION

Toothmin tooth cream is a newly introduced remineralizing agent that is based on Anticay Technology.³

Anticay is a mixture of calcium sucrose phosphates and inorganic calcium phosphates consisting of 10–12% calcium and 8–10% phosphorous by weight.³

Calcium sucrose phosphate decreases tooth enamel demineralization and promotes enamel remineralization.³

Its effective remineralizing action is because of its solubility in water providing high concentrations of free calcium and phosphate ions³

NovaMin found in SHY NM (calcium sodium phosphosilicate) is a highly biocompatible bioactive glass that was originally developed as an osteo-regenerative material⁴

This material, when exposed to aqueous media, is supposed to provide calcium and phosphate ions⁴

When incorporated into a dentifrice, NovaMin particles might be deposited onto dentine surfaces and help in remineralisation.⁴

CONCLUSION

The limitations of this study include, being a short term study, low sample size and in vitro experiment.

Shy NM toothpaste (anticay technology) and Toothmin toothpaste (Novamin Technology) both were equally effective in remineralising the demineralised enamel.

When compared which tooth paste had better remineralisation potential among the two, there was no statistically significant difference.

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