ABSTRACT

Objectives: A self-assembling peptide (Curodont Repair®) has shown great potential for natural repair of early caries lesions. However, combination of this treatment with fluoride agents has not been investigated.

Methods: Eighty specimens were prepared from extracted human teeth. Using an acidified gel, WSL was created on an exposed enamel window in all specimens. Micro-hardness measurements were taken before WSL (SMH1) and after WSL (SMH2). Specimens were randomly assigned to four treatment groups: control received no treatment (CON), treated with Curodont Repair® (CR); CR + 5000 ppm prescription toothpaste (CRp); and CR + 1100 ppm standard fluoride-toothpaste (CRs). All groups were subjected to 2-week pH-cycling caries model. Between demineralization and remineralization, specimens in CRp and CRs received 2-min exposure to their respective toothpaste slurries. Following pH-cycling SMH3 was measured on each WSL, and (%ΔSMH) was calculated [%ΔSMH = (SMH3-SMH2)/SMH2 x100]. Data were analyzed using Paired t-test and ANOVA followed by Student-Newman-Keuls at 5% significance level.

Results: Data analysis revealed significantly greater gain (p<0.05) in hardness (remineralization) in CR (23.32%) and CRp (3.82%) compared to significant loss in hardness (p<0.05) in CON (74.21%) and CRs (8.86%). CR and CRp were not significantly different from each other but significantly higher than CON and CRs.

Conclusions: Findings suggest that treating WSL with CR was capable of inhibiting further progression and re-hardened incipient-enamel lesions. Although CR followed by high-fluoride prescription toothpaste showed significant gain in hardness, results showed that adding prescription toothpaste does not provide significant additional remineralization relative to applying only CR. Results suggested that CR efficacy might be reduced when used in conjunction with standard fluoride-toothpaste.

INTRODUCTION

Current treatment for early caries lesions (white spot lesion (WSL)) has shifted from the traditional drill and fill methodologies to a less invasive approach that surrounds active monitoring of WSL progression and remineralization with topical fluoride or fluoride containing toothpastes. However, the penetrability of fluorides is limited and can only reach a few µm into enamel subsurface caries lesions. “Curodont Repair” by Credentis a product in the European market, offers the capability of natural repair of WSL through emerging biomimetic remineralization strategies. Curodont Repair made up of monomeric self-assembling peptides (P11-4), which diffuses into the subsurface of WSL and self-assembles into 3D fibrillar scaffolds in response to local conditions of high ionic strength and acidic pH within the lesion body. This study investigated whether or not the use of Curodont Repair combined with either high-fluoride prescription toothpaste or standard-fluoride toothpaste might improve the efficacy of Curodont Repair. Results: Findings suggest that treating WSL with CR was capable of inhibiting further progression and re-hardened incipient-enamel lesions. Although CR followed by high-fluoride prescription toothpaste showed significant gain in hardness, results showed that adding prescription toothpaste does not provide significant additional remineralization relative to applying only CR. Results suggested that CR efficacy might be reduced when used in conjunction with standard fluoride-toothpaste.

RESULTS

Data analysis using Paired t-test and ANOVA followed by Student-Newman-Keuls at 5% significance level revealed significantly higher gain in hardness (remineralization) in CR (23.32%) and CRp (3.82%) compared to significant loss in hardness in CON (74.21%) and CRs (8.86%). CR and CRp were not significantly different from each other.

CONCLUSIONS

Under the limitations of this study it can be concluded that treating white spot lesions with Curodont Repair® was capable of inhibiting further progression and re-hardened the incipient enamel lesions. Although Curodont Repair® followed by application of high fluoride prescription toothpaste showed a significant gain in surface microhardness, results reflect that adding prescription toothpaste does not provide significant additional remineralization relative to applying Curodont Repair® alone. The results suggest that Curodont Repair® efficacy might be reduced when used in conjunction with standard fluoride toothpaste. Further research ought to be conducted to investigate this discrepancy in efficacy.

REFERENCES


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