

Pengaruh Penambahan Fluoride dalam Remineralisasi melalui Proses PILP terhadap Kekerasan Email = Influence of Fluoride on Remineralization via The Polymer-Induced Liquid Precursor (PILP) Process on Enamel Microhardness

Runi Oktayani, author

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Abstrak

Latar Belakang: Proses PILP adalah proses remineralisasi yang menggunakan makromolekul bermuatan, yakni polyaspartic acid, untuk menstabilkan ion calcium phosphate dalam larutan tersaturasi, dan mencegah nukleasi spontan serta presipitasi mineral. Penambahan ion fluoride pada proses ini akan membentuk kristal fluorapatite yang memiliki kekerasan lebih tinggi dari hidroksiapatit. Tujuan: Penelitian ini bertujuan untuk mengetahui pengaruh penambahan fluoride dalam larutan remineralisasi melalui proses PILP terhadap kekerasan email. Metode: 25 sampel gigi dibagi menjadi 5 kelompok. Kelompok 1 (email normal) sebagai kontrol positif, kelompok 2 (email terdemineralisasi) sebagai kontrol negatif, kelompok 3 email yang diremineralisasi melalui proses PILP, kelompok 4 email yang diremineralisasi melalui proses PILP dengan penambahan fluoride 5 ppm, kelompok 5 email yang diremineralisasi melalui proses PILP dengan penambahan fluoride 25 ppm. Seluruh sampel disimpan dalam inkubator pada suhu 370C selama 14 hari. Selanjutnya dilakukan uji kekerasan mikro untuk melihat kekerasan email. Data yang diperoleh dianalisis secara statistik dengan one-way ANOVA dan uji Post Hoc Tamhane. Hasil: Terdapat perbedaan bermakna kekerasan mikro email setelah diremineralisasi melalui proses PILP tanpa dan dengan penambahan fluoride 5 ppm dan 25 ppm. Kesimpulan: Remineralisasi melalui proses PILP dengan penambahan fluoride 5 ppm memiliki kekerasan mikro yang lebih tinggi dibandingkan tanpa penambahan fluoride dan dengan penambahan fluoride 25 ppm.

.....Background: PILP process is a remineralization used charged macromolecule, polyaspartic acid, to stabilize calcium and phosphate ion in order to prevent mineral spontaneous nucleation and precipitation. Fluoride was added to form fluorapatite crystals which have a higher microhardness than hydroxyapatite. Objective: To determine the effect of adding fluoride in remineralization solution through the PILP process on enamel microhardness. Methods: 25 teeth were divided into 5 groups. Group 1 (normal enamel) as a positive control, group 2 (demineralized enamel) as a negative control, group 3 demineralized enamel which remineralized through PILP process, group 4 demineralized enamel which remineralized through PILP process with 5 ppm fluoride, group 5 demineralized enamel which remineralized through PILP process with 25 ppm fluoride. All samples were stored in an incubator at 370C for 14 days. Vicker's microhardness test was performed to see enamel microhardness. The data were statistically analyzed with one-way ANOVA and Tamhane Post Hoc Test. Result: There is a difference between enamel microhardness after being remineralized through PILP process without and with 5 and 25 ppm fluoride. Conclusion: Remineralization via PILP process with addition of 5 ppm fluoride has a higher microhardness value than without and with 25 ppm fluoride.