Analisis Pelepasan Ion Fluoride dan Kalsium dari Formulasi Fluoride Varnish Menggunakan Minyak Perasa dan Dikalsium Fosfat Dihidrat Kombinasi Kasein dan Xylitol = Analysis of the Release of Fluoride and Calcium Ions from Fluoride Varnish Formulation Using Flavor Oil and Dicalcium Phosphate Dihydrate Combination with Casein and Xylitol

Dhea Putriani, author

Abstrak

Di Indonesia, data menyebutkan bahwa 93 persen anak usia dini pada rentang usia lima hingga enam tahun mengalami karies. Fluoride telah diakui sebagai bahan aktif, yang bisa digunakan dalam pencegahan karies. Aplikasi fluoride varnish yang memiliki pelepasan ion fluoride dan kalsium yang cepat, selain meningkatkan efektivitas dalam pencegahan karies tingkat tinggi juga menambah nilai kenyamanan dalam hal rasa dan aroma pada pasiennya, terutama anak-anak. Penelitian ini melakukan studi tentang formulasi dasar fluoride varnish dengan penambahan minyak perasa dan agen remineralisasi dikalsium fosfat dihidrat. Hasil formulasi akan diuji kandungan pelepasan ion fluoride dan kalsium setelah 6 jam menggunakan alat ion selektif elektroda. Variabel bebas yang diujikan yaitu perasa, konsentrasi perasa, jenis kalsium dan konsentrasi kalsium fosfat. Hasil data dianalisis dengan uji ANOVA satu arah dan Tukey post hoc dengan tingkat signifikansi =0,05. Hasil membuktikan perbedaan variabel yang diujikan memberikan hasil yang berbeda secara signifikan terhadap pelepasan ion fluoride dan kalsium. Pelepasan ion fluoride tertinggi diperoleh dari formulasi peppermint 2,5% dan DCPD-Xylitol 1% sebesar 296,8952 mg/L. Untuk kalsium, formulasi peppermint 2,5% dan DCPD-Casein 3% yang memberikan kumulatif pelepasan ion kalsium tertinggi sebesar 113, 8667 mg/L Selain itu, kelayakan ekonomi juga dianalisis untuk dengan meninjau nilai NPV, IRR, Net B/C dan Payback Period.

<hr>

In Indonesia, the data states that 93 percent of early childhood in the age range of five to six years have caries. Fluoride has been recognized as an active ingredient, which can be used in caries prevention. The application of fluoride varnish, which has a fast release of fluoride and calcium ions, in addition to increasing effectiveness in the prevention of high caries levels also adds value in terms of taste and aroma comfort in patients, especially children. This study conducted a study of a basic formulation of fluoride varnish with the addition of a flavoring oil and a remineralization agent of dicalcium phosphate dihydrate. The results of the product will be tested for the release of fluoride and calcium ions after 6 hours using a selective ion electrode. The independent variables tested were types of flavor, flavor concentration, types of calcium, and calcium phosphate concentration. The results of the data were analyzed by a one way ANOVA test and Tukey post hoc with a significance level = 0.05. The results prove the differences in the variables tested gave significantly different effects on the release of fluoride and calcium ions. The highest fluoride ion release was obtained from a 2.5% peppermint formulation and 1% DCPD-Xylitol at 296.8952 mg/L. For calcium, 2.5% peppermint formulation and 3% DCPD Casein which provide the highest cumulative release of calcium ions reaches 113, 8667 mg/L. Also, economic viability is also analyzed to review NPV, IRR, Net B/C and Payback Period