

Theobromine effects on enamel surface microhardness: in vitro

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Abstrak

Efek teobromin terhadap kekerasan mikro permukaan email. Karies gigi masih menjadi masalah kesehatan gigi di Indonesia. Fluor adalah salah satu bahan pencegah karies gigi namun keamanan dan bahaya fluorosis masih diperdebatkan. Teobromin adalah senyawa alkaloid yang terkandung di dalam biji kakao. Teobromin dipercaya dapat meningkatkan kekerasan mikro email dengan terjadinya perubahan mineral pada lapisan permukaan email. Tujuan: Menentukan pengaruh teobromin terhadap kekerasan permukaan email gigi. Dosis efektif teobromin untuk mempengaruhi kekerasan email akan ditetapkan juga. Metode: 40 potongan mahkota gigi premolar ditanam pada resin epoksi. Selanjutnya spesimen dibagi secara random menjadi 4 kelompok, yaitu kontrol (aquadest), teobromin 100mg/L (T100), teobromin 500mg/L (T500), dan teobromin 1000mg/L (T1000). Spesimen direndam selama 15 menit, kemudian diuji kekerasan mikronya dengan menggunakan Knoop microhardness tester. Hasil: Peningkatan kekerasan mikro email terjadi setelah perlakuan dengan empat konsentrasi teobromin yang berbeda. Peningkatan kekerasan mikro email tertinggi terjadi pada kelompok T1000 dan terdapat perbedaan bermakna dibandingkan dengan ketiga kelompok lainnya ($p < 0,05$). Simpulan: Teobromin merupakan bahan pencegah karies gigi yang potensial karena kemampuannya dalam meningkatkan kekerasan permukaan email gigi.

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Dental caries is still a dental health problem in Indonesia. Fluoride, one of the dental caries prevention materials but its safety and the danger of fluorosis is still debated. Theobromine is an alkaloid compounds contained in cocoa beans. Theobromine is believed to increase enamel microhardness with mineral changes in the enamel superficial layer. Objectives: To determine the influence of Theobromine on the enamel surface microhardness. Effective dose of theobromine to affect enamel hardness will be determined as well. Methods: This study used 40 premolar tooth crown pieces that were embedded in epoxy resin. Furthermore specimens were randomly divided into 4 groups, which were control (distilled water), theobromine 100mg/L (T100), theobromine 500mg/L (T500) and theobromine 1000mg/L (T1000). The specimens were immersed for 15 minutes and microhardness test was performed using Knoop microhardness tester. Results: Increasing enamel microhardness was observed after treatment with four different theobromine concentration. The highest increased of enamel microhardness was shown in T1000 group and difference compared to other group were statistically significant ($p < 0.05$). Conclusion: Theobromine is a potential dental caries prevention material due to its effect in improving the surface microhardness of tooth enamel.