

## INTISARI

Pada email gigi selalu dalam kondisi antara demineralisasi dan remineralisasi. Remineralisasi memerlukan ketersediaan ion kalsium ( $\text{Ca}^{2+}$ ), fosfat ( $\text{PO}_4^{3-}$ ), dan fluor ( $\text{F}^-$ ) dalam saliva. *Casein Phosphopeptide-Amorphous Calcium Phosphate Fluor* (CPP-ACPF) dan *Functionalized Tricalcium Phosphate* (fTCP) mengandung ion  $\text{Ca}^{2+}$ , ion  $\text{PO}_4^{3-}$ , dan ion  $\text{F}^-$  yang berbeda. Tujuan penelitian ini adalah untuk mengetahui pengaruh aplikasi CPP-ACPF dan fTCP secara topikal terhadap konsentrasi ion  $\text{Ca}^{2+}$ , ion  $\text{PO}_4^{3-}$ , dan kekerasan permukaan email gigi.

Penelitian eksperimental semu dilakukan pada 20 gigi premolar satu atas yang dibelah menjadi dua bagian dari arah sagital menjadi 40 obyek. Satu sisi gigi diberi perlakuan aplikasi  $\pm 0,02$  gram CPP-ACPF dan sisi lain diberi aplikasi  $\pm 0,02$  gram fTCP masing-masing 5 menit dan dilakukan *pH-cycling* selama 5 hari. Pengukuran remineralisasi email gigi berdasarkan pengukuran kekerasan permukaan gigi, konsentrasi ion  $\text{Ca}^{2+}$ , dan ion  $\text{PO}_4^{3-}$ . Data dianalisis menggunakan *independent t-test*.

Hasil penelitian menunjukkan bahwa rata-rata kekerasan permukaan email ( $372,120 \pm 14,333$ ), konsentrasi ion  $\text{Ca}^{2+}$  ( $33,573 \pm 0,864$ ), dan ion  $\text{PO}_4^{3-}$  ( $48,045 \pm 0,989$ ) lebih tinggi pada kelompok fTCP dengan perbedaan yang bermakna ( $p < 0,05$ ) antara kelompok CPP-ACPF dan kelompok fTCP. Dapat disimpulkan bahwa permukaan email gigi lebih keras setelah pemberian aplikasi fTCP dibanding aplikasi CPP-ACPF secara topikal. Kandungan ion  $\text{Ca}^{2+}$  dan ion  $\text{PO}_4^{3-}$  pada permukaan enamel gigi lebih besar setelah pemberian aplikasi fTCP dibanding aplikasi CPP-ACPF secara topikal.

Kata Kunci: CPP-ACPF, fTCP, remineralisasi, nilai kekerasan gigi, konsentrasi ion kalsium, konsentrasi ion fosfat.

## ABSTRACT

Enamel surface of the teeth always in a dynamic conditions, which is always a change in conditions between demineralization and remineralization. The availability of calcium ions ( $\text{Ca}^{2+}$ ), phosphate ( $\text{PO}_4^{3-}$ ), and fluoride ( $\text{F}^-$ ) in saliva contribute in the process remineralization on tooth surface. Casein Phosphopeptide fluorine-amorphous calcium phosphate (CPP-ACPF) and Functionalized Tricalcium Phosphate (fTCP) has a different content of  $\text{Ca}^{2+}$  ions, and  $\text{PO}_4^{3-}$  ions, and  $\text{F}^-$  ions. The purpose of this study was to determine differences in the effect of the application of CPP-ACPF and fTCP topically to the microhardness value, the content of  $\text{Ca}^{2+}$  ions, and  $\text{PO}_4^{3-}$  ions of enamel permanent tooth.

Quasi-experimental studies performed on 20 teeth an upper premolar tooth and cut into two parts of the sagittal to 40 object. One part of teeth treated applications  $\pm 0.02$  gram CPP-ACPF and the other parts of the given application fTCP  $\pm 0.02$  gram during 5 minutes and then pH-cycling for 5 days. Remineralization of tooth enamel measured by measuring the microhardness of the tooth surface, the content of  $\text{Ca}^{2+}$  ions, and  $\text{PO}_4^{3-}$  ions.

These results indicate that microhardness of enamel surface ( $372,120 \pm 14,333$ ), the content of  $\text{Ca}^{2+}$  ions ( $33,573 \pm 0,864$ ), and  $\text{PO}_4^{3-}$  ions ( $48,045 \pm 0,989$ ) is higher fTCP group than CPP-ACPF. The groups that there is a significant difference ( $p < 0.05$ ) in enamel microhardness, the content  $\text{Ca}^{2+}$  ions, and  $\text{PO}_4^{3-}$  ions between treatment CPP-ACPF group and fTCP group. The conclusion of this study is the microhardness of the tooth enamel of young permanent teeth is higher after topical application of fTCP than CPP-ACPF. The content of  $\text{Ca}^{2+}$  ions, and  $\text{PO}_4^{3-}$  on the surface of the tooth enamel of young permanent teeth is higher after topical application of fTCP than CPP-ACPF.

**Keywords:** CPP-ACPF, fTCP, remineralization, microhardness, calcium ions content, phosphate ions content.