

**PENGARUH pH LINGKUNGAN TERHADAP KEKERASAN MIKRO
MODIFIED TRIKALSIMUM SILIKAT DAN SEMEN TRIKALSIMUM
SILIKAT DENGAN AKSELERATOR SEBAGAI
BAHAN PENGISI RETROGRAD**

INTISARI

Pasca prosedur bedah periapikal, bahan pengisi retrograd selalu berkontak dengan lingkungan pH yang asam karena adanya proses penyembuhan. Penelitian ini bertujuan untuk mengkaji pengaruh pH lingkungan terhadap kekerasan mikro *modified* trikalsium silikat dan semen trikalsium silikat dengan akselerator sebagai bahan pengisi retrograd.

Enam belas spesimen dibagi menjadi 4 kelompok. Kelompok 1 : material semen trikalsium silikat dengan akselerator yang direndam pada larutan PBS pH 5, kelompok 2 : material *modified* trikalsium silikat yang direndam pada larutan PBS pH 5, kelompok 3 : material semen trikalsium silikat dengan akselerator yang direndam pada larutan PBS pH 7,4, dan kelompok 4 : material *modified* trikalsium silikat yang direndam pada larutan PBS pH 7,4. Uji kekerasan mikro diukur dengan menggunakan *Vickers microhardness tester* setelah diberi kelembapan 7 hari dengan larutan *Phosphate Buffer Saline* (PBS) yang disimpan pada suhu 37°C. Data dianalisa menggunakan ANAVA dua jalur dengan tingkat kepercayaan 95% ($\alpha = 0,05$).

Hasil ANAVA dua jalur menunjukkan terdapat perbedaan kekerasan mikro antar kelompok berdasarkan jenis material ($p < 0,05$) dan tidak terdapat perbedaan kekerasan mikro antar kelompok berdasarkan jenis pH serta interaksi material dan jenis pH terhadap kekerasan mikro ($p > 0,05$).

Kesimpulan dari penelitian ini adalah jenis material dapat mempengaruhi kekerasan mikro pada pH tertentu. Kekerasan mikro paling tinggi terjadi pada material semen trikalsium silikat pada pH 7,4, sedangkan terendah terjadi pada material *modified* trikalsium silikat pada pH 5.

Kata kunci : kekerasan mikro, pH lingkungan, MTA, akselerator

THE EFFECT OF ENVIRONMENTAL pH ON THE MICROHARDNESS OF MODIFIED TRICALCIUM SILICATE AND TRICALCIUM SILICATE CEMENT WITH ACCELERATOR AS RETROGRADE FILLING MATERIALS

ABSTRACT

After the periapical surgery procedure, retrograde filling materials always in contact with acidic environment pH because of the healing process. The aim of this study was to examine the effect of environmental pH on the microhardness of modified tricalcium silicate and tricalcium silicate cement with accelerator as retrograde filling materials.

Sixteen specimens were divided into 4 groups. Group 1 : tricalcium silicate cement material with accelerator was immersed in PBS solution (pH 5), group 2 : modified tricalcium silicate was immersed in PBS solution (pH 5), group 3 : tricalcium silicate cement material with accelerator was immersed in PBS solution (pH 7,4) and group 4 : modified tricalcium silicate was immersed in PBS solution (pH 7,4). Microhardness test was measured with *Vickers microhardness tester* after 7 days of immersion in a Phosphate Buffer Saline (PBS) solution stored at 37°C. Data were analyzed using two-way ANOVA with 95% confidence interval ($\alpha = 0,05$).

The results of two-way ANOVA indicated that there were differences of microhardness between groups based on material type ($p < 0,05$) and there were no differences of microhardness between groups based on pH type and material interaction or pH type against microhardness ($p > 0,05$).

The conclusion of this study was the material type could affect microhardness at certain pH. The highest microhardness occurred in tricalcium silicate cement material with accelerator at pH 7,4 PBS solution, while the lowest occurs in tricalcium silicate modified at pH 5 PBS solution

Keywords : microhardness, environmental pH, MTA, accelerator