Oral Session O15/Dental Materials

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Enamel shear-bond strength of Glass Carbomer after heating with three polymerization units

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Introduction. Glass Carbomer represents new material derived from GIC. Advantages of Glass Carbomer are high wear resistance, biocompatibility - no acid, high F release, and fluorapatite particles incorporated. Setting reaction of the material was accelerated by its heating with high energy polymerization unit. The aim of this study is to establish shear bond strength of the Glass Carbomer material heated with three polymerization units.

Material & method. Material comprised 50 teeth divided in 5 groups of 10 specimens. (3 Glass Carbomer and 2 GIC- conditioned and unconditioned). Teeth were embedded in epoxy resin, enamel surface flattened and cylinders of the Glass Carbomer (Glass Carbomer Products) and GIC (control group) were fabricated according the respective manufacturers instructions. Samples of Glass Carbomer material were heated using LED polymerization units Elipar Freelight (1000mW/cm$_2$) (3M Espe), Bluephase (1200 mW/cm$_2$) (Vivadent) and Bluephase 16i (1600 mW/cm$_2$) (Vivadent). GIC samples were chemically cured. Shear-bond testing was performed in Universal testing machine (LRX, Lloyd Instruments) with 1kN load cell and 1mm/min crosshead speed. Statistical analysis was performed using ANOVA and Tukey HSD test.

Results. Glass Carbomer shows significantly higher shear bond strength (13,7MPa) comparing to GIC (6, 7 MPa) ($p<0,05$). There are no statistically significant differences in the shear bond strength of Glass Carbomer material regarding the use of different polymerization units.

Conclusion. Enamel shear bond strength of Glass Carbomer material is comparable or higher than conventional GIC. Regarding this property Glass Carbomer material can be clinically used with high confidence. Further evaluation of other characteristics of this material is needed on larger samples.

