Poster Session P02/Dental Materials 1

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Effects of polymerisation unit on the flexural strength of Glass Carbomer

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Introduction: The aim of this study was to measure the flexural strength (FS) of new nano-ionomer cement and to determine if strength can be related to polymerisation unit and applied light intensity.

Material and Methods: The FS of commercial glass ionomer (Fuji IX GP Fast, GC) and new nano-ionomer cement (Glass Carbomer) were measured using a method based on ISO9917-2:1998. Specimens (n=10 per group) were prepared in SS split moulds (2x2x25mm), compressed and light-cured according to manufacturers' instructions, stored at 37oC (100% RH) for 24 hours. Light curing was carried out immediately after mixing using Bluephase G2 (IvoclarVivadent), Elipar™ FreeLight 2 and Elipar™ TriLight (3M ESPE). Each specimen was tested using an Universal testing machine at 1 mm/min crosshead speed and loaded to fracture using a 3-point bending test (l=20mm), with 1kN load cell. Data were analysed by ANOVA and Bonferroni post hoc test p<0.05.

Results: FS of Glass Carbomer (122.29±9.9MPa) was significantly higher than value for highly viscous glass ionomer Fuji IX (57.85±7.54MPa) (p<0.001). There were no statistically significant differences in FS of GlassCarbomer samples cured by means of different light sources. FS of Fuji IX GP fast cured with EliparFreeLight (98.87±20MPa) showed significantly higher results than samples cured with halogen lamp (31.27±7.49MPa) (p<0.001).

Conclusion: The nano-ionomer cement Glass Carbomer shows higher flexural strength than highly viscous glass ionomer cement cured by different types of curing light. Different types of curing light (halogen lamp and LED lamp) significantly influence flexural strength of glass ionomer cement.