ABSTRACT: 2006 IADR General Session & Exhibition

1615 Flexural Strength of Resin-Modified Glass-Ionomer Cements (RMGICs)

*O.T. AL-NAIMI[1], M.B. LOPES[2], J.F. MCCABE[1], and **L.H. PRENTICE**[3], [1]University of Newcastle-upon-Tyne, Newcastle upon Tyne, United Kingdom, [2]State University of Campinas, Piracicaba, SP, Brazil, [3]SDI Ltd, Bayswater, VIC, Australia*

Objective: To measure the flexural strengths (FS) of a number of commercial RMGICs at 1 day and 1 week, in order to determine if strength development or ultimate strength can be related to composition.

Methods: The FS of three commercial RMGICs [**Riva** LC, SDI Ltd (RLC); Photac-Fil Quick, 3M Espe (PFQ); and Fuji II LC, GC Corp (F2LC)] were measured using a method based on ISO9917-2:1998. Specimens (n=10 per group) were prepared in SS split moulds (2x2x25mm), compressed, light-cured according to manufacturers' instructions, stored at 37°C (100%RH) for 1h, removed into distilled water at 37°C for 1 day (1d) or 1 week (1w), and loaded to fracture using a 3-point bending apparatus (l=20mm). Data were analysed by ANOVA and Tukey's test (p=0.05).

Results:

	FS (MPa)±SD		
	RLC	PFQ	F2LC
1d	58.5 ±11.7^{a,b}	46.3±11.0^{a}	55.9±12.0^{a,b}
1w	68.8±12.1^{a,b}	60.9±5.4^{b}	64.4±7.3^{a,b}

Superscripts indicate significant differences in rows or columns. At both times RLC was strongest, and PFQ weakest, though differences between materials were not significant. Each material developed most of its FS within 1d; only PFQ increased significantly in FS from 1d to 1w. Slower FS development in PFQ is likely due to more cement-forming Polyacrylic Acid (PA) in the liquid: PFQ reportedly has 30-50% "Polyethylene Polycarbonic acid", which is higher than either RLC (15-25% PA) or F2LC (20-25% PA). Ultimate FS may be inversely related to 2-Hydroxyethyl Methacrylate (HEMA) concentration, which is lower in RLC liquid (20-25%) than in either PFQ (25-50%) or F2LC (30-35%).

Conclusion: Differences between materials were not significant at either time. Only PFQ had a significant increase in strength from 1 day to 1 week. Higher FS and more rapid development may be related to lower PA and HEMA concentrations in the liquid.

Seq #134 - Cements: Physical Properties
11:00 AM-12:00 PM, Friday, 30 June 2006
Brisbane Convention & Exhibition Centre Exhibit Hall 1

Back to the Dental Materials: III - Ceramics and Cements Program
Back to the IADR General Session & Exhibition (June 28 - July 1, 2006)

#043