Saad Liaqat, Oral Health Dent Manag 2014, 13:2
http://dx.doi.org/10.4172/2247-2452.S1.003

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference and Exhibition on
Dental & Oral Health
April 21-23, 2014 Crown Plaza Dubai, UAE

Adhesion and mechanical properties of dental composites

Saad Liaqat
Eastman Dental Institute, UK

Objectives: Assess how replacement of the activator DMPT by the surface active and methacrylate containing amine SAN, and TEGDMA diluent with higher molecular weight PPGDMA, affects mechanical and adhesive properties of dental composites.

Methods: Base monomer UDMA and diluent monomer TEGDMA(T) or PPGDMA(P) in 3:1 mass ratio were mixed with 5 wt % HEMA, 1wt% CQ and 1wt% DMPT (D) or SAN (N) to provide 4 composites designated as TD, TN, PD and PN. These were combined with silane treated glass particles. Powder to liquid ratio was 4:1. Results were compared with commercial Z250.

The biaxial flexural strength / modulus of discs light cured both sides for 40s (10 mm diameter, 1 mm thick) were determined after 24 hours in distilled water. Composite debonding force was determined using a "push out" test and ivory dentine blocks from 2 elephant tusks used as received or hydrated and dehydrated for 24 hours prior to use. Cylindrical holes (3mm diameter, 5 mm deep) were drilled and filled by composite after treatment or no treatment with 37 % phosphoric acid gel for 20s.

Results: TD, TN, PD, PN and Z250 strengths were 160, 155, 150, 130 and 170 MPa respectively. Moduli were 3. 2 ± 0. 2 GPa for experimental composites, and 4. 2 GPa for Z250.

Factorial analysis gave average debonding forces (DF) for hydrated / dehydrated ivory source 1 and 2 as 625 & 650 N. Those without water treatment were 350 & 370 N respectively. Theaverage DFfor 37 % acid treated and un-treated samples were 730 & 270 N respectively. The average DF for TD, TN, PD, PN and Z250 were 420, 520, 485, 595 and 485 N respectively.

Conclusions: DMPT and TEGDMA replacement bySAN and PPGDMAcauses minor reduction in composite strength but improves dentine bonding.

Biography

Saad Liaqat is currently a third year postgraduate PhD student in Biomaterials Division at Eastman Dental Institute London, which is part of University College London, UK. He is currently, working on novel dental composite with ability to remineralise the tooth structure, and having self –adhesive, and anti-microbial properties. He has been awarded BDS degree with distinction from KCD, Peshawar, Pakistan in year 2009. He has, so far presented his work (Oral, Poster) in six conferences across UK, Europe, and USA. He is one of the few student selected on HEC Pakistan scholarship for PhD in world top (5) universities.

saad.liaqat.11@ucl.ac.uk