

Cytotoxicity of polyurethane dimethacrylate derived from palm oil polyol.

Abstract

Objective: The aim of this study was to investigate the cytotoxicity effect of polyurethane dimethacrylate monomer derived from palm oil polyol (PUDMA) and 2 experimental composite resins based on these monomer PUDMA- based composites) compared to an experimental Bis-GMA/TEGDMA-based composite and EsthetX flowable composite (Dentsply, Caulk, USA).

Methods: The experimental composite resins were prepared by mixing 0.25% and 0.75% by weight camphorquinone and ethyl (4-dimethyl amino) benzoate with 60% filler for each of the following monomer systems; I) PUDMA monomer (PUDMA-based composite resin), II) Bis-GMA/TEGDMA at ratio of 75:25 by weight, III) PUDMA/BisGMA-TEGDMA at ratio of 50:50 by weight. Eight disk specimens of 2mm thick and 8mm in diater were prepared from the PUDMA monomer and each experimental composites and EsthetX. All specimens were cured for 40 seconds on both sides. Mouse fibroblast cell lines (L-929) and MTS assay were used to evaluate the cytotoxicity effect of all composites extraction according to ISO 10993-12:2002. Data was analysed using ANOVA and multiple comparison was carried out, $P=.05$

Results: The percentage of viable cells was lowest in the PUDMA monomer, $P < .05$. However, it was evident that the percentage of viable cells in the PUDMA/BisGMA-TEGDMA, Bis-GMA/TEGDMA and EsthetX flowable composite was high and no statistical difference were detected.

Conclusion: PUDMA derived from palm oil polyol showed equally high percentage of viable cells compared to Bis-GMA/TEGDMA-based composites and EsthetX flowable composite. This study was supported by e-Sceince Fund, Ministry of Science and Innovation, Malaysia 03-01-03SF0190

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Journal:	Journal of Dental Research
Year:	2010

Keywords :

Cytotoxicity of polyurethane dimethacrylate derived from palm oil polyol.

Please cite as :

ABU KASIM, N.H., AL-SANABANI, F., MUHAMAD, S. & GAN, S. 2010. **Cytotoxicity of polyurethane dimethacrylate derived from palm oil polyol. *Journal of Dental Research.***

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