

Cytotoxic and Genotoxic effects of three cements used in fixed prosthesis



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Review

Durability and success of oral rehabilitation depends on the adhesion to the dental structures for long periods of time. Adverse effects result from all materials and devices used in the oral cavity. Dental cements, essential for the success of oral rehabilitation, may be responsible for the release of substances that can induce negative effects on cells, including their death.

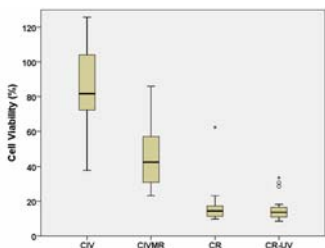
Objectives

The aim of this study is to compare the cytotoxic and genotoxic effects of three luting cements, namely the glass ionomer cement Ketac™ Cem Easymix **CIV**, the resin-modified glass ionomer cement Ketac™ Cem Plus **CIVMR** and the resin cement Relyx™ Unicem 2 Automix **CR**- light cured and non-light cured.

Results

CV is slightly cytotoxic
CR is severely cytotoxic
CIVMR is moderately to slightly cytotoxic

MTT assay



Crystal Violet assay

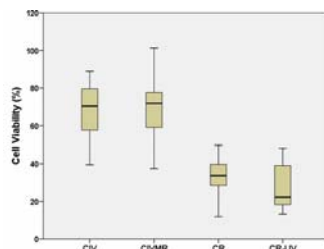
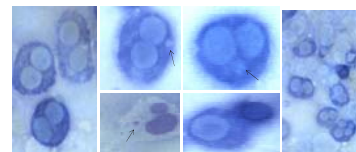


Fig.1. 3T3 mouse fibroblast viability box-plots. Statistical significant differences were determined (Games-Howell $p < 0,001$ and $p > 0,05$)

Experimental Methods

3T3 mouse fibroblast cells were exposed to different dilutions of 24 h incubated cement extracts. After 24 hours of exposition, cell viability was measured by MTT assay and Cristal violet staining method. Genotoxic effects of these cements were also determined using the micronuclei assay.



DNA damage quantified by the presence (%) of MicroNucleus in BiNucleated cells (MNBN).

Cell viability is related with cement extracts amount

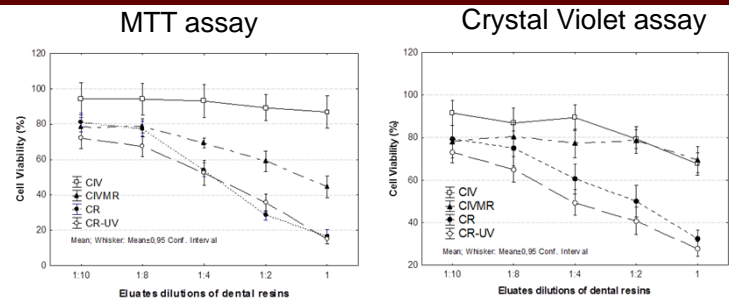


Fig.2. 3T3 mouse fibroblast viability in the presence of increasing amounts of CIV, CIVMR, CR- light cured and CR non-light cured extracts.

Resin cement is genotoxic

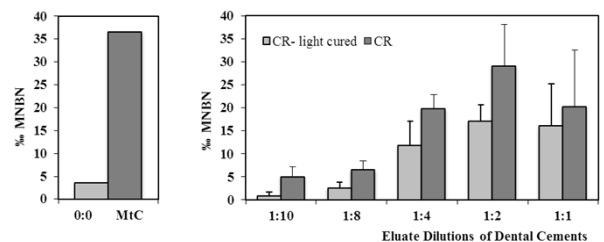


Fig. 3. Cytokinesis-blocked micronucleus assay in 3T3 mouse fibroblast exposed to eluates of CR- light cured and CR non-light cured. MtC – Mitomicina (positive control).

Conclusion

CIV is less cytotoxic than the CIVMR, and both have an effect in terms of cellular mortality statistically lower than the other two (CR and CR-UV), which between them are not significantly different.

Light cure of resin cements does not seem to reduce fibroblastic cytotoxicity.

Resin cement also showed genotoxicity, which is higher without light cured treatment.

Acknowledgements

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