TOXICITY EVALUATION OF INJECTABLE B-TCP/MCPM BONE CEMENT ASSOCIATED WITH MESOPOROUS SILICA AND BONE GROWTH REGULATING PEPTIDE (OGP) IN CHO-K1 CELLS
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Calcium phosphate cements (CPCs) have been widely explored as a good alternative synthetic graft because they can be molded or injected to be used as bone defect filler in order to adapt to the shape of the surfaces of bone defects. In addition, mesoporous silica has been prominent for bone repair due to its high surface area and porosity, besides its excellent biological properties, such as compatibility and bioactivity, which allow these particles to be used as potential carriers of active biological molecules. The objective was to evaluate the cytotoxicity by XTT and clonogenic survival (CS) assays, genotoxicity by comet assay (CA) and mutagenicity by the micronucleus test (MN) of injectable calcium phosphate bone cement (CaP), CaP associated with mesoporous silica (CaPSi) and CaP associated with mesoporous silica functionalized with osteogenic growth peptide (CaPSi-OGP). Eluates were made according to ISO 10993-12 and used in four concentrations (C1= 0,2 g.mL⁻¹; C2= 0,02 g.mL⁻¹, C3= 0,002 g.mL⁻¹; C4= 0,0002 g.mL⁻¹) in CHO-K1 cells. As positive controls, doxorubicin (XTT, CS, MN) and hydrogen peroxide (CA) were used, and CHO-K1 cells without the action of any treatment were used as a negative control (NC). Three independent experiments were conducted. Statistical analysis was performed using ANOVA followed by Tukey's test and Dunnett’s. The level of significance was 5%. The cellular viability (XTT) of all materials presented a statistically significant difference compared to NC only in high concentration (C1). The materials did not present late cytotoxicity (CS). Only the high concentration (C1) of CaPSi and CaPSi-OGP were mutagenic (p<0.05, Dunnett’s). All materials were not genotoxic. It was concluded that CaP, CaPSi and CaPSi-OGP should be used in low concentrations to ensure the safety of the materials, since it was verified cytotoxicity and mutagenicity in CHO-K1 cells only at high concentration.