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CYTOTOXICITY STUDY IN PBMC CULTURES DUE TO EXPOSITION OF A POSSIBLE RADIOACTIVE-BONE CEMENT BASED IN PMMA-HAp.

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Background: Radiovertebroplasty has emerged as a therapeutic alternative for the treatment of bone metastasis that present low therapeutic response or high radiological risk to conventional treatments. The radionuclides beta-sources coupled to a bone cement implanted in situ produces absorbed doses for tumor control in the same level of megavoltage radiotherapy. Such composite based on HAp (hydroxyapatite) biophosphates and Polymethylmethacrylate (PMMA) may to simulate the natural bone tissues to be restored. A broad study of the interactions of the implant bone-cement with cellular bone constituents is required. Cellular biocompatibility of PMMA have already been investigated. Cell adhesion studies in pure HAp bioceramics have also been carried out to evaluate the cell diffusion in this biological microenvironment. Methods: 1. Synthesis of the matrix of biophosphates and preparation of the macroaggregate RB cement in pellets of 2 mm in diameter and 1 mm in thickness. 2. Obtaining PBMC cells by centrifugation and density separation. 2. Cultive of the PBMC cells in RPMI medium modulated and no modulated by PHA.4. Study of toxicity due to cellular exposition to the cold bone cement per collection of supernatant's cells and MTT cell viability analysis at time kinetics of 24, 48 and 72 h of exposure of the cultures to the bone cement. Results: The morphologic analysis showed: 1. At 24h, a set of selected cell fields near the pellets with monocyte grouping and formation of a surrounding cellular halo, related to a possible aggregation response. 2. At 144h, long term cell survival. 3. No statistical significance was found for $p<0.05$ between experimental groups exposed to the PMMA and PMMA + HAp pellets. Conclusions: The PBMC cells exposed to a cold RB cement based on PMMA+HAp presented morphologic elements that indicate no toxicity. It was possible to assess that there is survival and cellular aggregation near pellets, preserving their similar immune function characterized by this type of hematopoietic cells.