EVALUATION OF THE TOXICITY IN THE PBMC CELL CULTURE OF COLD BONE CEMENT.

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Background: Percutaneous techniques introduced by use of PMMA (polymethylmethacrylate with chemical nomenclature \([\text{CH}_2\text{C(CH}_3)(\text{CO}_2\text{CH}_3)]_n\) as bone cement to join the fractured bone parts. These percutaneous procedures are complementary to therapeutic treatments within metastatic tumor control in the skeletal bone system. There are a number of biophosphonates considered bioceramics, which many researchers were studying already. Among those that can highlight is the Hydroxyapatite (HAp with chemical nomenclature \([\text{Ca}_5(\text{PO}_4)_3(\text{OH})]\)), contains 69% of its composition equivalent to natural bone, since HAp is part of the nature of the bone, and the 20% of collagen matrices fibers as connective tissue. The mixture of HAp with the PMMA has already been proposed, reaching optimal adhesion’s response of osteoblasts in the biomaterial. Many oncological patients undergoing treatment are immunosuppressed patients, although in non-oncological patients the use of bone cement has a high degree of biocompatibility. In all possible situations, this cement is introduced in the interstitions of the tissue, which implies that it has contact with the plasma and therefore with mononuclear cells of the peripheral system (PBMC). Objective. Our goal is to study the toxicity of the bone cement in peripheral blood mononuclear cell (PBMC) and to compare the viability of PBMCs cultures in contact with bone cement. Materials and Methods. Bone cement was synthesized in our research group from PMMA and HAp. PBMCs, from ex-vivo, was placed in vitro culture. The control was made with PBMC’s cultures non-exposed to bone cement. A cell group was exposed to bone cement with distinct composition and experimental viability assay was performed at 24,48 and 72h exposition. After the stimulation time, cell proliferations in both groups were measured by MTT assay. Results. The cell viability shown in the morphological analysis of the culture of PBMC cells exposed to bone cement is much greater. Observations made in a period of 24, 48, 72 hours to later assess the in vitro viability, showin non descrease of viability of the PBMC in comparison to control. Conclusion. The composite assembled by PMMA and HAp presented non-toxicity to PBMC cell culture.