THIMEROSAL INDUCES VIABILITY LOSS, REACTIVE SPECIES FORMATION AND INITIAL APOPTOSIS IN HUMAN PERIPHERAL BLOOD MONONUCLEAR CELLS

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INTRODUCTION: Thimerosal (THIM), an ethylmercury-derived compound, has been used over a century as a conservant in topical products, tattoo inks and vaccines. Recent toxicological studies have linked THIM to skin-eye pseudoallergic reactions and cumulative toxicity in infants. **OBJECTIVE:** the goal of this study was to investigate the toxic effects of THIM on human peripheral blood mononuclear cells (lymphocytes and monocytes). **MATERIAL AND METHODS:** Peripheral blood mononuclear cells (PBMC) were collected aseptically from venous blood (±20 mL), from 10 healthy volunteers (1:1 male/female ratio, 30±10 years). Briefly, the cells were separated using Ficoll-Paque™ reagent by the density gradient method. Initially, the PBMC were exposed to a range of concentrations of THIM to evaluate cell viability by MTT assay (0,5 μM, 1 μM, 2,5 μM, 5 μM and 10 μM). After, the concentration 2.5 μM was defined to determine reactive species levels by fluorimetry assay (RS; kinetic fluorimetry), cellular morphology and apoptosis/necrosis indexes by flow cytometry (ANNEXIN-PI®, commercial kit). The results are expressed as means±SEM of five independent experiments (*n*=5). Approved by the Ethics Committee of the Federal University of Santa Maria (Project No. 88887.505377/2020-00; Plataforma Brasil). **RESULTS AND CONCLUSION:** By MTT assay, we found out that PBMC exposed to THIM 2,5 μM, 5 μM and 10 μM presented significant loss of cell viability, with an IC_{50} of approximately 5 μM. THIM 2,5 μM increased the levels of RS in the cultured cells; and also induced significant morphologic alterations (decrease in the size and increase in the granularity). In addition, the PBMC exposed to THIM 2.5 μM exhibited increased ANNEXIN staining, indicating an early phase of apoptosis. According to reports in other cells, we have shown that THIM is toxic to PBMC as well. Considering the approach using donated human PBMC, these results highlight the prejudice induced by THIM in the immune system. In conclusion, the present results provide new insights into THIM's cytotoxicity and raise the margin to debate the preservant safeness.

Key-words: Thimerosal (THIM); preservant; cytotoxicity.