

EVALUATION OF THE GENOTOXIC POTENTIAL OF FLUOSILIC ACID IN U87MG AND U251MG CELL CULTURES

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INTRODUCTION: Prolonged exposure to fluoride (F) can represent a serious public health problem, leading to the development of fluorosis, even when ingested in small amounts on a continuous basis. In addition to the effects on bone tissue, F can impact other organs, including the central nervous system. **OBJECTIVES:** To evaluate DNA damage induced by fluosilicic acid (FA) in vitro in glioblastoma cell lines U87MG (TP53 proficient) and U251MG (TP53 mutant). **MATERIALS AND METHODS:** Cells (1×10^5) were plated for 24 hours for adhesion and then exposed to FA at concentrations between 0.0375 and 0.600 mg/L, to the positive control (4-NQO; 0.060 μ M) and to the negative control (culture medium) for 3 hours, in duplicate, in two independent experiments. DNA damage was assessed by the Comet Assay under alkaline conditions. The slides were stained with silver nitrate. To calculate the visual score (0–400), each cell was classified into five damage categories (from 0 = no damage to 4 = maximum damage), with the analysis of 100 cells per well. **RESULTS AND CONCLUSION:** FA induced significant DNA damage ($p < 0.05$) in the U87MG strain at all concentrations except the lowest (0.0375 mg/L). In the U251MG strain, damage was observed only at the two highest concentrations. These findings suggest a potential genotoxic effect of FA on central nervous system cells. The higher sensitivity observed in the U87MG cell line (functional TP53) may indicate a differential response associated with TP53 gene status, suggesting that TP53 proficiency may influence the mechanisms of detection and response to genetic damage. Future studies will include complementary assays to evaluate other cellular parameters and elucidate the molecular mechanisms involved in these effects.

Keywords: genotoxicity; fluoride; comet assay; in vitro.

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