Subtoxic Concentration of Cadmium Abrogates the Apoptosis Resistance of Prostate Cancer Cells

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Metal ions, such as cadmium, which are necessary to health, are important factors inducing many diseases, including prostate cancer in the condition of absence or excess. Although, the toxic action of cadmium is not completely understood, it is recognized to be multifactorial. Recently, some reports have highlighted cadmium as a potential co-adjuvant in the solid tumor therapy. Therefore, the study of sensitivity of cadmium mechanisms in some tumors leads to better comprehension of chemotherapeutic treatment. The aim of this work was to investigate the cadmium effects on human prostate cancer cells (PC3 cells), which display an exceptional resistance to therapy. Our results showed that cadmium inhibited PC3 cells growth (60 µM, IC50 value). In the context of signal transduction, we observed an increase of the death receptor TNFR1 expression as well as its adaptor protein FADD. Bax/Bcl2 ratio and the cleavage of poly (ADP-ribose) polymerase 1 were augmented by cadmium treatment. Moreover, it was also observed a decrease of mitogen activated protein kinase (ERK1/2), phosphoinositide-3-kinase (PI3K) and nuclear factor κB (NFκB) expression, this last associated to apoptosis resistance. Our results suggest that cadmium-induced apoptosis involves suppression of NFκB. Besides, our findings indicate that cadmium might have a potential action as an antitumoral agent at subtoxic concentration.

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