

Cell alterations induced by a biotherapeutic for influenza

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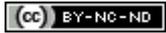
ABSTRACT

Introduction: Influenza viruses have been responsible for highly contagious acute respiratory illnesses with high mortality, mainly in the elderly, which encourages the development of new drugs for the treatment of human flu. The biotherapeutics are medicines prepared from biological products, which are not chemically defined. They are compounded following the homeopathic procedures indicated for infectious diseases with known etiology [1]. **Aim:** The purpose of the present study is to verify cellular alterations induced by a biotherapeutic prepared from the infectious influenza A virus. **Methodology:** This biotherapeutic was prepared for this study in the homeopathic potency of 30X according to the Brazilian Homeopathic Pharmacopeia [2]. The concentration of 10% was not cytotoxic to cells, as verified by neutral red assay. The cellular alterations observed in MDCK cells were analyzed by optical microscopy for the quantification of mitosis, nucleoli and lipid bodies. The mitochondrial activity was assessed by MTT assay and the phosphofructokinase-1 (PFK-1) enzyme activity was analyzed on the MDCK cells treated for 5, 10 and 30 days. Macrophages J778.G8 were treated with this biotherapeutic to evaluate the immunostimulatory cytokine release. **Results:** The cellular alterations observed in MDCK cells were verified by optical microscopy. The number of lipid bodies present in MDCK cells stimulated for 10 days was significantly lower ($p < 0.05$) when compared to controls. The biotherapeutic significantly increased ($p < 0.05$) the number of mitosis and the mitochondrial activity of MDCK cells stimulated for 10 and 30 days. These changes were confirmed by a significant reduction ($p < 0.05$) on the PFK-1 activity. These results suggest that the biotherapeutic was able to activate the Krebs cycle and pentose-phosphate metabolism to the generation of amino acids and nucleotides, situations common to cells whose rate of mitosis is increased. The quantification of immunostimulatory cytokines by macrophages J774.G8 indicated that the tumor necrosis factor (TNF- α) production was higher ($p < 0.05$) in the supernatant of the macrophages pre-treated with this biotherapeutic and infected with influenza virus, suggesting an activation of the macrophages by this biotherapeutic. **Conclusion:** This biotherapeutic is able to induce some cellular alterations, which show strong evidence that it might be a promising option for the human flu. New experiments are being developed to understand the mechanisms of action of this biotherapeutic.

Key-words: biotherapeutic, influenza, homeopathy, human flu.

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