Chemotherapy-induced peripheral neurotoxicity

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Treatment of solid and hematological malignancies is still largely based on systemic chemotherapy, alone or in combination with surgery and or radiation treatment. In parallel with the improvement in anti-cancer therapy, the management of several among its most serious side effects became easier. However, other chemotherapy-related toxicities emerged as major clinical problems, sometimes requiring anticancer treatment modification or even withdrawal. Among them damage of the peripheral nervous system is particularly frequent and potentially severe after the administration of several widely-used compounds such as platinum-drugs, antitubulins, immunomodulatory drugs and proteasome inhibitors. In view of a scenario showing higher efficacy of anti-cancer therapy leading to a high number of cancer-survivors, the relevance of long-lasting or permanent side effects has also become increasingly important, being chemotherapy-induced peripheral neurotoxicity (CIPN) one of the most severe for its impact on treated subjects’ quality of life. Moreover, CIPN is associated with a remarkable increase in direct and indirect health-related cost in cancer patients. The most common entry sites into peripheral nervous system used by anticancer drugs are dorsal root ganglia and this might explain why sensory impairment is the most common clinical feature of CIPN. However, variable association with motor or autonomic damage is typical of the different drugs types. Moreover, neuropathic pain may be a common symptom, particularly with some of these compounds which are particularly toxic on small nerve fibers as it can be reproduced in relevant animal models.

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Studying of the anti-neoplastic effect of the extracts of higher fungi in short-term cellular cultures of glial cells

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Aim: The objective of our work was to investigate the influence on the cultures of glial tumors of the extracts of fungi Cordyceps sinensis and Ganoderma lucidum.

Methods: For the analysis of glioma sensitivity to the medicines we used a method of short-term cultivation (72 hours) with the subsequent 0.4% trypan blue staining for assessment of both the total of cells in the sample and determination of the percentage of viable cells in control and experimental samples. Tissue fragments were processed, removing vessels and necrotized parts from them. The obtained suspension of cells was cultivated Dulbecco’s Modified Eagle’s medium (DMEM) with addition of 10% fetal bovine serum (FBS) (“Sigma”, the USA)) in Petri dishes in the CO2 incubator in standard conditions. The samples containing not less than 70% of viable cells was included in the experiment. The concentration of medicines was counted taking into account the therapeutic dose and was added to the nutrient medium (experiment). Cell sensitivity to the action of medicines was estimated, comparing the amount of living cells in the experiment concerning control.

Result: As a result of our researches, there was some statistically significant reduction of the percentage of living cells after cultivation with the extracts, concerning control in the culture of cells, obtained from the fragments of gliomas of the III.-IV. anaplasia degree.

Conclusion: The results of our researches testify about the multidirectional influence of the preparations of fungi extracts under gliomas of various degree of anaplasia in the conditions in vitro.

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