Improvement of radiation efficacy for brain cancer F98 glioma by adding concomitant platinum compounds

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Background: Free platinum formulation: cisplatin, carboplatin and oxaliplatin as well as their liposomal formulation (Lipoplatin for cisplatin and Lipoxal for oxaliplatin) are largely used as cytotoxic agents in the treatment of many tumor types. However, free platinum formulation are known to cause sever adverse reactions. In treatment against glioblastoma multiform, the development of an aggressive but selective therapy is needed. In this project, we tested different platinum compounds to identify which one shows the best synergy with radiation. Material and methods: The cytotoxicity of platinum compounds against F98 glioma cell line was assessed by colony formation assay. Cell uptake for the same cell line and platinum was measured by Induced coupled plasma mass spectrometer. After four hours exposure to platinum, cells were irradiated (1.5 to 6.6 Gy) with a 60Co source. Results: The relative cytotoxcicity induced by the five platinum formulations was oxaliplatin > Lipoxal > cisplatin > Lipoplatin > carboplatin. On the other hand, when F98 cell line incubated with platinum were irradiated, the combination index calculated and the relative potency were Lipoplatin > carboplatin > oxaliplatin > Lipoxal > cisplatin. Conclusions: In the present work, Lipoplatin shows the best cytotoxic combination with radiation to treat F98 cell line in vitro.

Article published by EDP Sciences and available at http://www.radioprotection.org or http://dx.doi.org/10.1051/radiopro:2008583