

Protective Effect of Herniarin on Ionizing Radiation-Induced Impairments in Brain

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Abstract : Radiation-induced various degrees of brain injury and cognitive impairment have been described after cranial radiotherapy of brain tumors. High doses of ionizing radiation have a severe impact on the central nervous system, resulting in morphological and behavioral impairments. Structures of the limbic system are especially sensitive to radiation exposure. Hence, compounds or drugs that can reduce radiation-induced impairments can be used as promising antioxidants or radioprotectors. In our study Mice whole-body irradiation with ^{137}Cs was performed at a dose rate of 1,1 Gy/min for a total dose of 5 Gy with a "Gamma-capsule-2". Irradiated mice were treated with Herniarin (20 mg/kg) for five days before irradiation and the same dose was administrated after one hour of irradiation. The immediate and delayed effects of ionizing radiation, as well as, protective effect of Herniarin was evaluated during early and late post-irradiation periods. The results reveal that ionizing radiation (5 Gy) alters the structure of the hippocampus in adult mice during the late post-irradiation period resulting in the decline of memory formation and learning process. Furthermore, Simple Coumarin-Herniarin reveals a radiosensitizing effect reducing morphological and behavioral alterations.

Keywords : ionizing radiation, cognitive impairments, hippocampus, limbic system, Herniarin

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