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RESPONSIVENESS OF IRRADIATED RAT ANTERIOR PITUITARY CELLS TO HYPOTHALAMIC RELEASING HORMONES IS RESTORED BY TREATMENT WITH GROWTH HORMONE

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Hypopituitarism is a common sequela of irradiation in cancer patients. Here we report that recombinant human growth hormone (r-hGH) prevents cell death and restores secretory capacity of irradiated rat pituitary cells *in vitro*. Dispersed rat pituitary cells from male Sprague-Dawley rats, irradiated with a 9 Gy sublethal dose, were incubated with r-hGH before, after, or before and after irradiation. Treatment with GH resulted in increased cell survival, which reached its maximum at the concentration of 5 nM, with an EC_{50} of 3.5 nM. Protective effects of GH on pituitary cells were more pronounced in cultures treated before and after irradiation. Similarly, beneficial effects of GH were observed on the secretory capacity of surviving cells. In fact, irradiated pituitary cells treated with GH secreted substantial amounts of GH, luteinizing hormone (LH), follicle stimulating hormone (FSH), prolactin (PRL), thyroid-stimulating hormone (TSH) and adrenocorticotropic hormone (ACTH) in response to specific releasing hormones. Such effects of GH were prevented in the presence of the specific GH receptor antagonists B2036 and G120K. Our results show that r-hGH exerts a specific protective effect on irradiated rat pituitary cells and suggest possible use of GH as an adjuvant agent for prevention of post-irradiation hypopituitarism.

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