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Autor(en) des Beitrags: Pickhard, AC; Margraf, J; Knopf, A; Stark, T; Piontek, G; Beck, C; Boulesteix, AL; Scherer, EQ; Pigorsch, S; Schlegel, J; Arnold, W; Reiter, R

Titel des Beitrags: Inhibition of radiation induced migration of human head and neck squamous cell carcinoma cells by blocking of EGF receptor pathways.

Abstract: Recently it has been shown that radiation induces migration of glioma cells and facilitates a further spread of tumor cells locally and systemically. The aim of this study was to evaluate whether radiotherapy induces migration in head and neck squamous cell carcinoma (HNSCC). A further aim was to investigate the effects of blocking the epidermal growth factor receptor (EGFR) and its downstream pathways (Raf/MEK/ERK, PI3K/Akt) on tumor cell migration in vitro. Migration of tumor cells was assessed via a wound healing assay and proliferation by a MTT colorimetric assay using 3 HNSCC cell lines (BHY, CAL-27, HN). The cells were treated with increasing doses of irradiation (2 Gy, 5 Gy, 8 Gy) in the presence or absence of EGF, EGFR-antagonist (AG1478) or inhibitors of the downstream pathways PI3K (LY294002), mTOR (rapamycin) and MEK1 (PD98059). Biochemical activation of EGFR and the downstream markers Akt and ERK were examined by Western blot analysis. In absence of stimulation or inhibition, increasing doses of irradiation induced a dose-dependent enhancement of migrating cells (p< 0.05 for the 3 HNSCC cell lines) and a decrease of cell proliferation (p< 0.05 for the 3 HNSCC cell lines). The inhibition of EGFR or the downstream pathways reduced cell migration.
significantly (almost all p< 0.05 for the 3 HNSCC cell lines). Stimulation of HNSCC cells with EGF caused a significant increase in migration (p< 0.05 for the 3 HNSCC cell lines). After irradiation alone a pronounced activation of EGFR was observed by Western blot analysis. Our results demonstrate that the EGFR is involved in radiation induced migration of HNSCC cells. Therefore EGFR or the downstream pathways might be a target for the treatment of HNSCC to improve the efficacy of radiotherapy.

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