Curcumin acts as anti-tumorigenic and hormone-suppressive agent in murine and human pituitary tumour cells in vitro and in vivo.

Abstract:
Curcumin (diferuloylmethane) is the active ingredient of the spice plant Curcuma longa and has been shown to act anti-tumorigenic in different types of tumours. Therefore, we have studied its effect in pituitary tumour cell lines and adenomas. Proliferation of lactosomatotroph GH3 and somatotroph MtT/S rat pituitary cells as well as of corticotroph AtT20 mouse pituitary cells was inhibited by curcumin in monolayer cell culture and in colony formation assay in soft agar. Fluorescence-activated cell sorting (FACS) analysis demonstrated curcumin-induced cell cycle arrest at G2/M. Analysis of cell cycle proteins by immunoblotting showed reduction in cyclin D(1), cyclin-dependent kinase 4 and no change in p27(kip). FACS analysis with Annexin V-FITC/7-aminoactinomycin D staining demonstrated curcumin-induced early apoptosis after 3, 6, 12 and 24 h treatment and nearly no necrosis. Induction of DNA fragmentation, reduction of Bcl-2 and enhancement of cleaved caspase-3 further confirmed induction of apoptosis by curcumin. Growth of GH3 tumours in athymic nude mice was suppressed by curcumin in vivo. In endocrine pituitary tumour cell lines, GH, ACTH and prolactin production were inhibited by curcumin. Studies in 25 human pituitary adenoma cell cultures have confirmed the anti-tumorigenic and hormone-suppressive effects of
curcumin. Altogether, the results described in this report suggest this natural compound as a good candidate for therapeutic use on pituitary tumours.

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