Preclinical assessment of curcumin as a potential therapy for B-CLL.


Source

Section of Hematology and Oncology, Evans Department of Medicine, Boston Medical Center, Boston, Massachusetts 02118, USA.

Abstract

Curcumin, the principle component of the spice turmeric, has been used as an anti-inflammatory medication in India and China for centuries. Recent studies, predominantly using actively dividing cell lines, have suggested that this compound could be used as a chemopreventative or therapeutic agent for epithelial tumors. As curcumin has been reported to inhibit the NIK/IKK complex, an activity that would be expected to induce apoptosis in B cell malignancies, we sought to determine whether curcumin induces apoptosis in vitro in primary chronic lymphocytic leukemia (B-CLL) cells. Primary leukemic cells were incubated with varying dosages of curcumin, followed by assessment for apoptosis. The role of PPARgamma or NF-kappaB signaling in curcumin-induced apoptosis was examined by cotreatment with a PPARgamma antagonist or EMSA of nuclear NFkappaB complexes. We also examined whether a clinically achievable concentration of curcumin (1 microM) would augment the apoptotic effects of fludarabine, dexamethasone, vincristine or the PDE4 inhibitor rolipram. In B-CLL cells from 14 patients, curcumin-induced apoptosis with a mean EC(50) of 5.5 microM. In contrast, the EC(50) for whole mononuclear cells from a healthy donor was 21.8 microM. In a 48 hr wash-out time course, curcumin-induced apoptosis was time-dependent, with a substantial reduction in apoptosis observed when curcumin was removed after 5 hr. Curcumin treatment reduced basal nuclear NF-kappaB levels and 1 microM curcumin augmented both vinca alkaloid and PDE4 inhibitor-induced apoptosis in B-CLL cells. Our studies suggest that curcumin may augment the efficacy of established or experimental therapies for B-CLL.

PMID:16947318