

Curcumin induces cell apoptosis in human chondrosarcoma through extrinsic death receptor pathway

Yi-Chin Fong^{1,2,3}, Chih-Hsin Tang^{4,5}

1. School of Chinese Medicine, China Medical University, Taichung, Taiwan
2. Graduate Institute of Chinese Medical Science, China Medical University, Taichung, Taiwan
3. Department of Orthopedic Surgery, China Medical University Hospital, Taichung, Taiwan
4. Department of Pharmacology, School of Medicine, China Medical University, Taichung, Taiwan
5. Graduate Institute of Basic Medical Science, China Medical University, Taichung, Taiwan

Abstract

Chondrosarcoma is a soft tissue sarcoma with a poor prognosis that is unresponsive to conventional chemotherapy. Surgical treatment leads to severe disability with high rates of local recurrence and life threat. Curcumin, an active compound in turmeric and curry, has been proven to induce tumor apoptosis and inhibit tumor proliferation, invasion, angiogenesis, and metastasis of cancer cells. In this study, we investigated the anticancer effects of curcumin in human chondrosarcoma cells. Curcumin induced apoptosis in human chondrosarcoma cell lines (JJ012 and SW1353) but not in primary chondrocytes. Curcumin induced upregulation of Fas, FasL, and DR5 expression in chondrosarcoma cells. Transfection of cells with Fas, FasL, or DR5 siRNA reduced curcumin-induced cell death. In addition, p53 involved in curcumin-mediated Fas, FasL, and DR5 expression and cell apoptosis in chondrosarcoma cells. Most importantly, animal studies revealed a dramatic 60% reduction in tumor volume after 21 days of treatment. Thus, curcumin may be a novel anticancer agent for the treatment of chondrosarcoma.