

Therapeutic potential of curcumin in human prostate cancer. III. Curcumin inhibits proliferation, induces apoptosis, and inhibits angiogenesis of LNCaP prostate cancer cells in vivo.

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BACKGROUND: Earlier work from our laboratory highlighted the therapeutic potential of curcumin (turmeric), used as a dietary ingredient and as a natural anti-inflammatory agent in India and other Southeast Asian countries. This agent was shown to decrease the proliferative potential and induce the apoptosis potential of both androgen-dependent and androgen-independent prostate cancer cells in vitro, largely by modulating the apoptosis suppressor proteins and by interfering with the growth factor receptor signaling pathways as exemplified by the EGF-receptor. To extend these observations made in vitro and to study the efficacy of this potential anti-cancer agent in vivo, the growth of LNCaP cells as heterotopically implanted tumors in nude mice was followed. **METHODS:** The androgen-dependent LNCaP prostate cancer cells were grown, mixed with Matrigel and injected subcutaneously into nude mice. Experimental group received a synthetic diet containing 2% curcumin for up to 6 weeks. At the end point, sections taken from the excised tumors were evaluated for pathology, cell proliferation, apoptosis, and vascularity. **RESULTS:** Curcumin causes a marked decrease in the extent of cell proliferation as measured by the BrdU incorporation assay and a significant increase in the extent of apoptosis as measured by an in situ cell death assay. Moreover, a significant decrease in the microvessel density as measured by the CD31 antigen staining was also seen. **CONCLUSIONS:** Curcumin could be a potentially therapeutic anti-cancer agent, as it significantly inhibits prostate cancer growth, as exemplified by LNCaP in vivo, and has the potential to prevent the progression of this cancer to its hormone refractory state. Copyright 2001 Wiley-Liss, Inc.

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