

Curcumin suppresses proliferation and induces apoptosis in human biliary cancer cells through modulation of multiple cell signaling pathways.

Carcinogenesis. 2011;32(9):1372-80

Cholangiocarcinoma (CCA) is a highly malignant, generally fatal adenocarcinoma arising from the bile duct epithelial cells (cholangiocytes) of the intrahepatic or extrahepatic biliary system. It is one of the most highly metastatic cancers, characterized by poor prognosis and therapeutic inefficiency and is an increasing health problem worldwide. Newer therapeutic alternatives are in need as available chemotherapeutic agents and radiation therapy are ineffective.

Over the years, several natural products have played a significant role in the development of anticancer drugs as >60% of the drugs are of natural origin. Even though Curcumin has been demonstrated to exhibit chemopreventive potential against a wide variety of tumors, there is a limited knowledge on its effect in CCA.

Objective:

To hypothesize whether Curcumin influence the growth of CCA through modulation of multiple cell signaling pathways.

Study Design:

Three human CCA cell lines representing different stages of adenocarcinoma were used in this study: poorly differentiated (KKU100), moderately different (KKU-M156) and well-differentiated (KKU-M214) adenocarcinoma were used to determine cell proliferation, NF- κ B activation, NF- κ B p65 localization and related parameters during the study.

Results:

Curcumin inhibited proliferation of CCA cells in a dose-dependent manner. The suppression of cell proliferation was significant at a Curcumin concentration of 50 μ M ($p < 0.05$)

Exposure of CCA cells to Curcumin was associated with significant repression of colony-forming ability

Exposure of CCA cells to 10 and 50 μ M Curcumin significantly increased the number of apoptotic cells from 23 to 42% in K KU100 cells, from 17 to 71% in K KU-M156 cells and from 26 to 37% in K KU-M214 cells ($p < 0.05$)

All three CCA cell lines exhibited significant NF- κ B activation upon treating with Curcumin

Conclusion:

Results indicated that antiproliferative and apoptotic effects of Curcumin were through activation of multiple cell signaling pathways, and thus, its activity against CCA should be further investigated.