In vitro and in vivo anticancer efficacy of silibinin against human pancreatic cancer BxPC-3 and PANC-1 cells.


Source

Cancer Biology Laboratory, School of Life Sciences, Jawaharlal Nehru University, New Delhi, India.

Abstract

Silibinin suppresses the growth of many cancers; however, its efficacy against pancreatic cancer has not been evaluated in established preclinical models. Here, we investigated in vitro and in vivo effects of silibinin against lower and advanced stages of human pancreatic carcinoma cells. Silibinin (25-100 μM) treatment for 24-72 h caused a dose- and time-dependent cell growth inhibition of 27-77% (P<0.05-0.001) in BxPC-3 cells, and 22-45% (P<0.01-0.001) in PANC-1 cells. Silibinin showed a strong dose-dependent G1 arrest in BxPC-3 cells (upto72% versus 45% in control; P<0.001), but a moderate response in advanced PANC-1 cells. Cell death observed in cell growth assay, was accompanied by upto 3-fold increase (P<0.001) in apoptosis in BxPC-3 cells, and showed only slight effect on PANC-1 cells. Dietary feeding of silibinin (0.5%, w/w in AIN-93M diet for 7 weeks) inhibited BxPC-3 and PANC-1 tumor xenografts growth in nude mice without any apparent change in body weight gain and diet consumption. Tumor volume and weight were decreased by 47% and 34% (P<0.001) in BxPC-3 xenograft, respectively. PANC-1 xenograft showed slower growth kinetics and silibinin decreased tumor volume by 34% (P<0.001) by seven weeks. Another 4 weeks of silibinin treatment to PANC-1 xenograft showed 28 and 33% decrease in tumor volume and weight, respectively. Silibinin-fed group of BxPC-3 tumors showed decreased cell proliferation and angiogenesis and an increased apoptosis, however, considerable inhibitory effect was observed only for angiogenesis in PANC-1 tumors. Overall, these findings show both in vitro as well as in vivo anticancer efficacy of silibinin against pancreatic cancer that could involve inhibition of cell proliferation, cell cycle arrest, apoptosis induction and/or decrease in tumor angiogenesis.

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PMID: 23022268