Selective cytotoxicity of goniothalamin against hepatoblastoma HepG2 cells.

ABSTRACT

Liver cancer has become one of the major types of cancer with high mortality and liver cancer is not responsive to the current cytotoxic agents used in chemotherapy. The purpose of this study was to examine the in vitro cytotoxicity of goniothalamin on human hepatoblastoma HepG2 cells and normal liver Chang cells. The cytotoxicity of goniothalamin against HepG2 and liver Chang cell was tested using MTT cell viability assay, LDH leakage assay, cell cycle flow cytometry PI analysis, BrdU proliferation ELISA assay and trypan blue dye exclusion assay. Goniothalamin selectively inhibited HepG2 cells [IC 50 = 4.6 (±0.23) μM in the MTT assay; IC 50 = 5.20 (±0.01) μM for LDH assay at 72 hours], with less sensitivity in Chang cells [IC 50 = 35.0 (±0.09) μM for MTT assay; IC 50 = 32.5 (±0.04) μM for LDH assay at 72 hours]. In the trypan blue dye exclusion assay, the Viability Indexes were 52 ± 1.73% for HepG2 cells and 62 ± 4.36% for Chang cells at IC 50 after 72 hours. Cytotoxicity of goniothalamin was related to inhibition of DNA synthesis, as revealed by the reduction of BrdU incorporation. At 72 hours, the lowest concentration of goniothalamin (2.3 μL) retained 97.6% of normal liver Chang cells proliferation while it reduced HepG2 cell proliferation to 19.8% as compared to control. Besides, goniothalamin caused accumulation of hypodiploid apoptosis and different degree of G2/M arrested as shown in cell cycle analysis by flow cytometry. Goniothalamin selectively killed liver cancer cell through suppression of proliferation and induction of apoptosis. These results suggest that goniothalamin shows potential cytotoxicity against hepatoblastoma HepG2 cells.

Keyword: Goniothalamin; HepG2 cell; Liver Chang cell; Cytotoxicity.