Hot water-extracted Lycium barbarum and Rehmannia glutinosa inhibit proliferation and induce apoptosis of hepatocellular carcinoma cells

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Abstract

AIM: To investigate the effect of hot water-extracted Lycium barbarum (LBE) and Rehmannia glutinosa (RGE) on cell proliferation and apoptosis in rat and/or human hepatocellular carcinoma (HCC) cells. METHODS: Rat (H-4-II-E) and human HCC (HA22T/VGH) cell lines were incubated with various concentrations (0-10 g/L) of hot water-extracted LBE and RGE. After 6-24 h incubation, cell proliferation (n = 6) was measured by a colorimetric method. The apoptotic cells (n = 6) were detected by flow cytometry. The expression of p53 protein (n = 3) was determined by SDS-PAGE and Western blotting. RESULTS: Crude LBE (2-5 g/L) and RGE (2-10 g/L) dose-dependently inhibited proliferation of H-4-II-E cells by 11% ($P < 0.05$) to 85% ($P < 0.01$) after 6-24 h treatment. Crude LBE at a dose of 5 g/L suppressed cell proliferation of H-4-II-E cells more effectively than crude RGE after 6-24 h incubation ($P < 0.01$). Crude LBE (2-10 g/L) and RGE (2-5 g/L) also dose-dependently inhibited proliferation of HA22T/VGH cells by 14%-43% ($P < 0.01$) after 24 h. Crude LBE at a dose of 10 g/L inhibited the proliferation of HA22T/VGH cells more effectively than crude RGE (56.8% +/- 1.6% vs 70.3% +/- 3.1% of control, $P = 0.0003 < 0.01$). The apoptotic cells significantly increased in H-4-II-E cells after 24 h treatment with higher doses of crude LBE (2-5 g/L) and RGE (5-10 g/L) ($P < 0.01$). The expression of p53 protein in H-4-II-E cells was 119% and 143% of the control group compared with the LBE-treated (2, 5 g/L) groups, and 110% and 132% of the control group compared with the RGE -treated (5, 10 g/L) groups after 24 h. CONCLUSION: Hot water-extracted crude LBE (2-5 g/L) and RGE (5-10 g/L) inhibit proliferation and stimulate p53-mediated apoptosis in HCC cells.