

Effect of Genistein on Apoptosis and Proliferation of Hepatocellular Carcinoma Hepa1-6 Cell Line

[Sanaei M¹](#), [Kavoosi F¹](#), [Valiani A²](#), [Ghobadifar MA³](#).

Abstract

Background:

One of the main causes of mortality is hepatocellular carcinoma (HCC) which accounts for the third leading cause of deaths and one in forty deaths worldwide. The flavonoids, natural antioxidant compounds, account for a major group of polyphenolic compounds. One of the major isoflavones in soybean is genistein (GE) which can inhibit proliferation and induce apoptosis. Isoflavones, major type of phenolic materials, derived from dietary plants and medicinal herbs play a significant role in cancer prevention and treatment. Correlation between dietary habits and cancer risk including breast, prostate, and colon cancer has been reported. Various bioactivities of these compounds such as anticarcinogenic and antioxidant are responsible for their chemopreventive activities by which induce migration, proliferation, cell cycle arrest, and apoptosis. GE, one of the major isoflavones, is considered as a potent chemopreventive agent against cancer. The aim of this study was to investigate the inhibitory and apoptotic effects of GE on HCC Hepa1-6 cell line.

Methods:

Cell viability assay and cell cycle analysis with flow cytometry were used to evaluate proliferative and apoptotic effect GE.

Results:

GE inhibited the growth of Hepa1-6 cells and induced apoptosis with a concentration and time-dependent fashion. During GE treatment for 24, the half maximal inhibitory concentration (IC₅₀) was 20 μ M, and the maximum inhibition of cell growth was 52% ($P < 0.01$). The percentage of apoptotic cells with a concentration of 20 μ M of GE after 24, 48, and 72 h was 35, 42, and 65%, respectively ($P < 0.01$).

Conclusions:

Our finding clearly indicated that GE can significantly inhibit proliferation of hepatocellular carcinoma Hepa 1-6 cell line and induce apoptosis in this cell line.

KEYWORDS:

Apoptosis; genistein; hepatocellular carcinoma; proliferation