# Effect of Genistein and 17-β Estradiol on the Viability and Apoptosis of Human Hepatocellular Carcinoma HepG2 cell line.

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## Abstract

### Background:

One of the most lethal cancers is hepatocellular carcinoma (HCC). Genistein (GE) is a choice compound for treatment of certain types of cancer. Phytoestrogens are plant derivatives that bear a structural similarity to 17-β estradiol (E2) and act in a similar manner. They are a group of lipophillic plant compounds with tumorigenic and antitumorigenic effects. E2 has stimulatory and inhibitory effects on cancer cell lines. This study was designed to investigate the antiproliferative and apoptotic effects of GE and E2 on the HCC HepG2 cell line.

### Materials and Methods:

HepG2 cells were cultured and treated with various concentrations of GE and E2 and then 3-[4, 5-dimethyl-2-thiazolyl]-2, 5-diphenyl-2H-tetrazolium bromideand flow cytometry assay were performed to determine cell viability and apoptosis.

### Results:

GE and E2 induced apoptosis and inhibited cell growth significantly. Reduction of cell viability by 50% required 20 μM E2 for E2-treatment groups and 20 μMGE for GE-treatment groups. The percentage of the GE-treated apoptotic cells was reduced by about 35%, 42%, and 47% ($P < 0.001$) and that of E2-treated groups 34%, 39%, and 42% ($P < 0.001$) after 24, 48, and 72 h, respectively.

### Conclusions:

Our experimental work clearly demonstrated that GE and E2 exhibited significant antiproliferative and apoptotic effects on human HCC HepG2 cells.

### KEYWORDS:

17-β estradiol; apoptosis; genistein; hepatocellular carcinoma; proliferation