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Apoptosis in Colon Cancer (HT29) Cells Exposed to Estradiol Valerat

Farahmandlou N[1], Jusheghani F[*2], Karimi Ghezeli Z[3]

[1]Department of Basic Sciences, Faculty of Pharmacy, Pharmaceutical Sciences Branch, Islamic Azad University, Tehran, Iran.(IAUPS)
[2] Department of Genetics, Tehran Medical Sciences Branch, Islamic Azad University, Tehran, Iran
[3]Department of Pharmaceutical Chemistry, Faculty of Pharmaceutical Chemistry, Pharmaceutical Sciences Branch, Islamic Azad University, Tehran, Iran (IAUPS)

***Abstract*:** *The recent studies have shown a link between estrogen and cancer cells proliferation. The aim of this study was to investigate the effects of estradiol valerate on apoptosis in colon cancer cells. In this laboratory-experimental study, colon cancer cells were exposed to different doses (0.001, 0.01, 0.1 and 1mg/ml) of estradiol valerate. MTT assay was used to measure cell viability in cancer cells. The data were statistically analyzed between groups using ANOVA. There was significant decrease in cell viability of colon cancer cells in groups exposed to 0.01, 0.1 and 1 mg/ml of estradiol valerate compared to control group (P<0.05). It can be concluded that estradiol valerate has cytotoxic effect on colon cancer and can induce apoptosis in colon cancer cells in cell culture.*

Keywords: *Estradiol valerate, Cell viability, HT29 Cells*

1. Introduction

Rectal cancer accounts for a relevant part of colorectal cancer cases, with a mortality of 4-10/100000 per year. [1] Estradiol, the predominant form of estrogen, also plays a critical role in sexual function. Estrogen receptors, as well as aromatase, the enzyme that converts testosterone to estrogen, are abundant in brain and other organs [2] Estrogen also have anticancer effects on various tissues including prostate. [3] Endogenous estradiol metabolites are equally anti-proliferative as tamoxifen in the context of human breast cancer cells. [4] Estrogen is also involved in carcinogenesis. The oncogenic effects of E2 have been investigated extensively in breast and ovarian cancers where hormone-receptor modulators are now an integral part of targeted treatment. On the other hand, little is known about the E2 preventive signaling in colorectal cancer. [5] The aim of this study was to investigate the effects of estradiol valerate on apoptosis in colon cancer cells.

2. Material and Methods

In this laboratory-experimental study, colon cancer cells were exposed to different doses (0.001, 0.01, 0.1 and 1mg/ml) of estradiol valerate. MTT assay was used to measure cell viability in cancer cells. The data were statistically analyzed between groups using ANOVA.

3. Results

Exposure of colon cancer cells to 0.001 mg/ml of estradiol valerate did not significantly change the cell viability in cancer cells compared with control group. However, there was significant decrease in cell viability of colon cancer cells in groups exposed to 0.01, 0.1 and 1 mg/ml of estradiol valerate compared to control group (P<0.05) (Figure I).

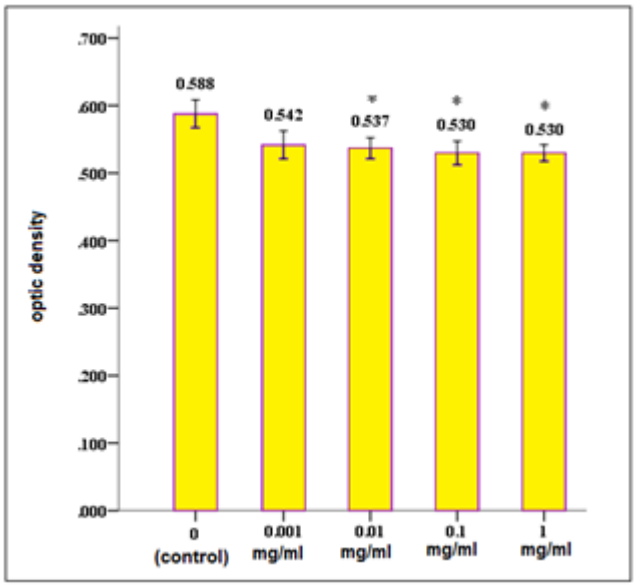

Fig. I. Optic density (indicating cell viability) in control and groups exposed to 0.001, 0.01, 0.1 and 1 mg/ml of estradiol valerate. * indicates significant difference at P<0.05.

4. Discussion

Our findings indicated that estradiol valerate has cytotoxic effects on colon cancer cells in cell culture. Estradiol has been shown that has a role in cancer treatment. [6] In women with advanced breast cancer and acquired resistance to aromatase inhibitors, a daily dose of 6 mg of estradiol provided a similar clinical benefit rate as 30 mg, with fewer serious adverse events[7]. However, there are studies showing that estrogens may have carcinogenic effects. It is of interest that E concentrations were significantly lower in patients with recurrent ovarian cancer. [8] E2 was shown to potentiate NNK-induced inflammation, cell proliferation, thereby leading to lung tumorigenesis [9]. Thyroid cancer is also well coupled with estrogen. [10] The results demonstrate that estradiol treatment potentiates growth of laryngeal tumors in nude mice[11].

In line with our findings it has been reported that endogenous estrogen lowers gastric cancer incidence in women, and cancer patients treated with estrogens have a lower subsequent risk of gastric cancer. [12] It has also been shown that of 17 beta -estradiol has protective effects against the development of Helicobacter pylori-induced gastric cancer [13]. The findings suggest that 17beta-estradiol treatment dramatically inhibits progression of human colon cancer cells. [14] Research have demonstrated involving of different cellular molecular events for the protective effects of E2 against colon cancer growth. [15]

5. Conclusion

It can be concluded that estradiol valerate has cytotoxic effect on colon cancer and can induce apoptosis in colon cancer cells in cell culture.

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7. References

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