

The Effects of Estradiol Valerate on Proliferation of Fibroblastoma Cells in Cell culture

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Abstract: *Estradiol is a sex steroid hormone playing a wide variety of roles in cellular and molecular level on our cells. The reports indicate that estradiol also has a significant part in cancer development. This study was exerted to determine the effects of estradiol valerate on proliferation of fibroblastoma cells in cell culture. In this laboratory experimental study, fibroblastoma cells were exposed to 10mg/ml, 1mg/ml, 0.1mg/ml, 0.01mg/ml and 0.001mg/ml of estradiol valerate in cell culture. After 48 hours, the viability of fibroblastoma cells was examined using MTT assay. The data was analyzed using ANOVA. Our findings show that viability of fibroblastoma cells decreased by increasing of estradiol valerate doses. Our findings show that estradiol valerate has anti-proliferative effects against fibroblastoma cells.*

Keywords: *Estradiol, Viability, Fibroblastoma Cell.*

1. Introduction

Estradiol, or more precisely, 17 β -estradiol, is a steroid and estrogen sex hormone, and the primary female sex hormone. Estradiol has significant role in development of female reproductive system. Estradiol is found in most vertebrates produced especially within the follicles of the female ovaries, but also in other endocrine and non-endocrine tissues.

Estradiol valerate (INN, USAN; brand names Altadiol, Deladiol, Delestrogen, Estraval, Progynova, Valergen, many others), or oestradiol valerate (BAN), is a synthetic ester, specifically the 17-pentanoyl ester, of the natural estrogen, 17 β -estradiol. It was introduced in the 1950s [1]-[3]. Estradiol valerate is applied for the treatment of heavy menstrual bleeding [4]. It has also effect on the quality of sexual life and is a contraceptive drug [5], [6]. Estradiol valerate has proliferative effects on ovary tissue [7]. It influences metabolism of cell, in particular, affects on metabolism of carbohydrates [8]. Neonatal exposure to estradiol valerate increases dopamine content in nervous cells [9].

The effects of estradiol valerate on cancer cells and cancer development have been studied by researchers [10], [11].

This study was exerted to determine the effects of estradiol valerate on proliferation of fibroblastoma cells in cell culture

2. Material And Methods

2.1 Estradiol Valerate Preparation

Estradiol Valerate was prepared as powder and different concentrations of Estradiol Valerate (10mg/ml, 1mg/ml, 0.1mg/ml, 0.01mg/ml and 0.001mg/ml of Estradiol Valerate) were used in our study.

2.2 Protocol of Study

We used MTT assay in this work to determine the effects of Estradiol Valerate on fibroblastoma cells viability in cell culture. Briefly, the procedure was continued and carried out in the following steps:

- Day One: 100 μ l of cells was added into each well (96 well plate) and incubate at 37 with 5% CO_2 overnight.
- Day Two: The media was removed and Estradiol Valerate was added and incubated at 37 with 5% CO_2 overnight. For control 10% FBS was added to media.
- Day Three: Estradiol Valerate was removed from media. 20 μ l of 5 mg/ml MTT was added to each well and incubated for 4 hours at 37°C. 150 μ l isopropanol was added and covered with tinfoil and agitate cells on orbital shaker for 15 min. Absorbance was read at 570 nm with a reference filter of 630 nm and recorded.

2.3 Statistical Analysis

Statistical significance was evaluated by one-way analysis of variance (ANOVA) using SPSS 19. Differences with $P < 0.05$ were considered significant.

3. Results

Fig.1: shows the viability of fibroblastoma cells in response to different doses of Estradiol Valerate.

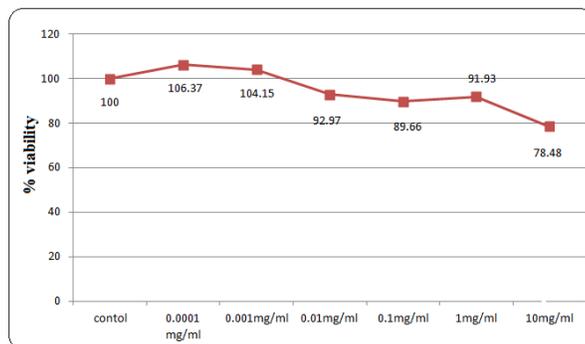


Fig.1.: Viability of fibroblastoma cells in response to different doses of Estradiol Valerate

Our findings show that viability of fibroblastoma cells decreased in response to increasing of Estradiol Valerate doses. However, viability of fibroblastoma cells significantly decreased in response to ≥ 0.01 mg/ml of Estradiol Valerate

4. Discussion

We have shown that Estradiol Valerate has reducing effects on proliferation of fibroblastoma cells according to the dose of Estradiol Valerate used. There are reports indicating that estrogens play role in cancer development [10]-[12]. However, there are also studies showing that estradiol may not influence breast cancer cells in cellular level [13]. On the opposite side, there are studies demonstrating the effects of estrogens in proliferation and development of cancer cells in molecular level [14].

In line with our finding, the anticancer effects of estradiol on cancer cells have been demonstrated in recent studies [15]. It has also been shown that 2-alkoxy and 2-benzyloxy analogues of estradiol act as anti-breast cancer agents through microtubule stabilization. These compounds may induce arrest of cell cycle and apoptosis in cancer cells [16]. Also, recently it has been shown that estradiol-cationic lipid hybrids of estradiol can elicit better anticancer activity [17]. However, further researches are required to reveal the cellular mechanism of action of estradiol valerate on cancer cells.

5. Conclusion

We have shown that Estradiol Valerate has reducing effects on proliferation of fibroblastoma cell according to the dose of Estradiol Valerate used.

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7. References

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