

Cytotoxic Effects of Diclofenac on Cervical Cancer Cells in Cell Culture

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Abstract: *There are studies showing that NSAIDs including diclofenac may have anticancer effects. This study was carried out to assess the effects of diclofenac on viability of cervical cancer cells (Hela cell line) in cell culture. Hela cells were exposed to 0.0001, 0.001, 0.01, 0.1, 1 and 10 mg/ml of diclofenac solution. MTT assay was used to determine cytotoxic effects of the diclofenac on Hela cells in cell culture. Control Hela cells were not exposed to diclofenac. Our results indicated that administration of 0.1, 1 and 10 mg/ml of diclofenac resulted in significant decrease in viability of Hela cells compared to control cells ($P < 0.05$, $P < 0.001$ and $P < 0.001$). Administration of 0.0001, 0.001 and 0.01 mg/ml of diclofenac did not significantly change viability of Hela cells compared to control group. According to our finding, high doses of diclofenac have cytotoxic effects on cervical cancer cells.*

Keywords: *Diclofenac , Hela cell line, Viability*

1. Introduction

The cervical cancer is caused by abnormal changed in shape, rate growth and physical and chemical features and spread to the other part of body [1],[2]. The HPV retro viruses is cause of cervical cancer about 90%. [3],[4]. Cervical cancer has no sign In the first stage, but vaginal abnormal bleeding and pelvic pain is the primary symptoms [1]. Cervical cancer is the fourth leading cause of death by cancer [5], and is the most common gynecological malignant disorder[9]. In developing countries, it happened about 70 %, and in low-income countries is one of the most common of death by caner [5].

Diclofenac is a nonsteroidal anti inflammatory drug (NSAID). Its pharmacological activity use in reduce pain and dysmenorrhea [6],[7], eliminate the acute pain associate caner, especially when the pain is along inflammation[8]. Studies showed that pre-treatment by aspirin increase the sensibility of cancer cells to TRAIL (Tumor necrosis factor related apoptosis-inducing ligand) [10], and the protect function of NSAIDs against colon, rectal stomach and ovarian cancer [11]. It has been also shown that aspirin induces the anti tumoric effect of bcl2 [12]. The recent studies showed that aspirin and diclofenac restrained the growth of cancer cell by inhibiting the production of cyclo-oxygenase(cox2) in cancer cells[13], reducing the risk of gastric and esophageal cancer[14]. Studies also show the cytotoxic effect diclofenac on hepatic cell [15]-[17]. This study was carried out to assess the effects of diclofenac on viability of cervical cancer cells (Hela cell line) in cell culture.

2. Materials and Methods

Different concentrations (0.0001, 0.001, 0.01, 0.1, 1 and 10mg/ml) of diclofenac were prepared and used in our study. Hela cells (cervical cancer cell line) were purchased from National Cell Bank of Iran (Pasteur Institute, Tehran, Iran). Cells were grown and incubated in standard situation. Then, cells were sub-cultured into

75cm² flasks, 96-well plates or 6-well plates. Cytotoxicity of different doses of the extract was assayed using MTT method. Analyses were conducted using the SPSS 20 and ANOVA.

3. Results

Our results indicated that administration of 0.1, 1 and 10 mg/ml of diclofenac resulted in significant decrease in viability of Hela cells compared to control cells (P<0.05, P<0.001 and P<0.001). Administration of 0.0001, 0.001 and 0.01 mg/ml of diclofenac did not significantly change viability of Hela cells compared to control group (Figure I).

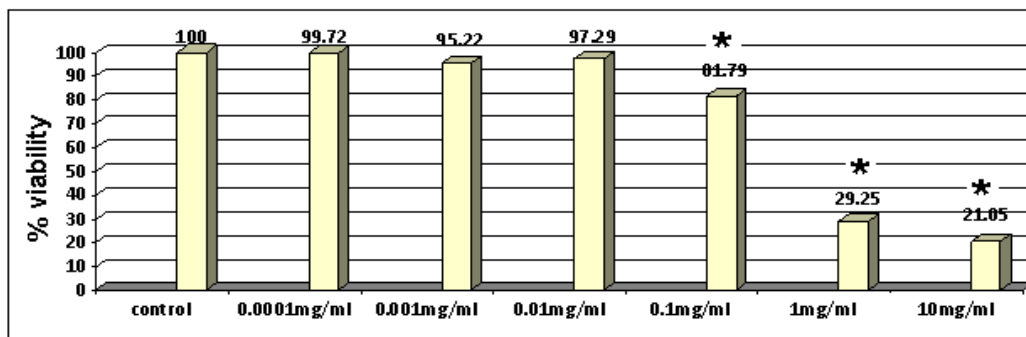


Fig. I. Viability of Hela cells compared to control group. * indicates significant difference compared to control group.

4. Discussion

Our study showed that high doses of diclofenac have cytotoxic effects on cervical cancer (HELA) cells. In line with this finding, there are studies showing that NSAID drugs have antitumor effect on cervical cancer [18],[19]. It has also been shown that NSAIDs have effective protection on colorectal cancer [19],[20]. Experimental evidences also demonstrated that diclofenac can reduce viability of lung cancer [21]. In contrast to our finding, there are studies revealing that diclofenac may induce hepatotoxicity, and leaving side effects on kidney. Also long-term use of diclofenac impair the general health [22].

5. Conclusion

According to our finding, high doses of diclofenac have cytotoxic effects on cervical cancer cells .

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