

Aspirin and Cervical Cancer

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Abstract: Although aspirin is a well-known drug used as pain killer, its effects on cancer cells has been investigated in recent years. We exerted laboratory experimental research to assess cytotoxic effects of aspirin on cervical cancer cells (Hela cells) in cell culture. Hela cells were exposed to 0.001, 0.01, 0.1, 1 and 10 mg/ml of aspirin solution. MTT assay was used to determine cytotoxic effects of the aspirin. Our results indicated that cytotoxic effects of aspirin on Hela cells was observed only at high dose (10mg/ml) of aspirin compared to control cells ($P < 0.001$). According to our finding, high dose of aspirin may have cytotoxic effects on cervical cancer cells in cell culture.

Keywords: Aspirin, Hela cell line, Viability

1. Introduction

Nonsteroidal anti-inflammatory drugs (NSAIDs) are designed primarily to decrease pain and inflammation. One of the most commonly used NSAIDs, acetylsalicylic acid (aspirin), is an agent that exerts its effects on the inflammatory cascades, irreversibly inhibiting cyclooxygenase (COX)-1, and modifying enzyme activity of COX-2, suppressing production of prostaglandins and thromboxanes [1].

Cervical cancer, comprising both squamous and glandular differentiation, is not only the fourth most frequent malignancy but also the fourth leading cause of cancer-related death in women worldwide [2]. Inflammation as a cofactor in human papillomavirus (HPV) and cervical carcinogenesis is an active area of research.

NSAIDs reportedly affect the risk of certain cancers, mainly as COX inhibitors [3]. The regular intake of aspirin and other NSAIDs is associated with decreased rates of certain cancers with an inflammatory component, especially colorectal cancer but also including lung, oesophageal, pancreatic, cervical, skin and ovarian cancers [4]-[6]. However, it is not clearly known whether aspirin would be helpful for cervical cancer. In this report, we investigate a potential cytotoxic effect of aspirin in different doses on human cervical cancer cells.

2. Materials and Methods

Different concentrations (0.001, 0.01, 0.1, 1 and 10mg/ml) of aspirin 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 aspirin was assayed using MTT method. Analyses were conducted using the SPSS 20 and ANOVA.

3. Results

Our results indicated that cytotoxic effects of aspirin on HeLa cells was observed only at high dose (10mg/ml) of aspirin compared to control cells ($P < 0.001$) (Figure I).

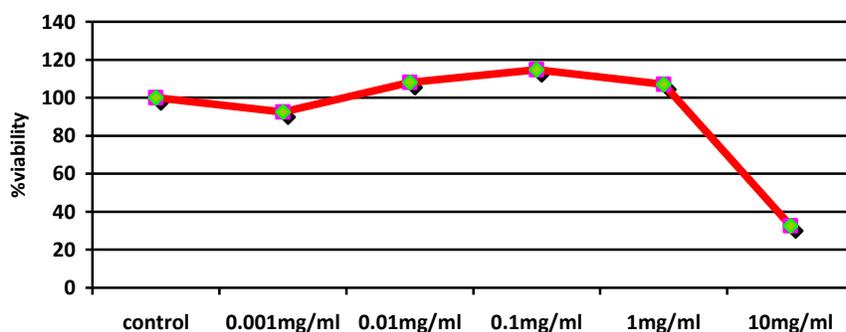


Figure I. Viability of HeLa cells compared to control group. * indicates significant difference compared to control group ($P < 0.001$).

4. Discussion

Aspirin is one of the most widely used drugs in the world [7]. There are some epidemiological evidences which suggest that regular aspirin use may have a protective effect against many tumors [8]. Many researches suggest that the anti-neoplastic activity of aspirin and other NSAIDs is predominantly mediated by inhibition of the COX enzymes, a family of enzymes that catalyze the conversion of arachidonic acid to prostaglandins [9]. Previous studies reported that aspirin inhibits the proliferation of cervical adenocarcinoma cells and several pharmacological targets have been identified for this effect. In this study, Cytotoxicity of different doses of the aspirin was assayed using MTT method on cervical cancer cells in cell culture. In agreement with this study, previous works also show that aspirin inhibited the proliferation of cancer cells [10]-[13]. We reported that aspirin is able to decrease the percentage of viability of cervical cancer cells especially at high dose (10mg/ml) of aspirin compared to control cells. However, this effect is not observed in lower doses.

5. Conclusion

According to our finding, high dose of aspirin may have cytotoxic effects on cervical cancer cells in cell culture.

6. Acknowledgements

We appreciate all who helped us to exert this study.

7. References

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