The Effects of Testosterone on AGS Human Gastric Cancer Cell Line

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Abstract: The studies have shown that the steroid hormones including testosterone may have inhibitory or stimulatory effects on cancer cells proliferation. The main objective of this study was to determine the effects of the testosterone on the proliferation of AGS human gastric cancer cells in cell culture. In this experimental study, 100 mg/ml of testosterone was provided and sterilized using a syringe filter. The different concentrations of hormone were provided using cell culture medium. The toxicity effect of the testosterone on cancer cells was measured using MTT assay method. Finally, the data were analyzed using ANOVA. The findings showed that 0.05, 0.5, and 5 mg/ml of testosterone had toxic effect on AGS human gastric cancer cells (p<0.001, p<0.001 and p<0.001, respectively). The results of this research suggest that appropriate doses of testosterone inhibit proliferation of AGS cells in cell culture

Keywords: AGS cell line, Testosterone

1. Introduction

Testosterone is a steroid sex hormone with an important role in the physiology in both sexes. It is involved in the development of morphological and functional parameters of the body via multiple molecular mechanisms.[1] Natural aging brings reduced production of growth and sex hormones, beginning in middle age, with noticeable physiologic changes by the sixth or seventh decade of life: reduced muscle mass, energy, and exercise capacity and alterations in sexual function.[2] It has also been shown that cancers of digestive system are associated with changes in various genes [3], [4] and are influenced by sex steroid hormones, particularly androgens. Testosterone is the most abundant biologically active androgen. Androgen receptors are located throughout the body. However, testosterone can be aromatized to estradiol, which increases proliferation some types of cancers. [6] Estrogens are critical players in many organs growth and disease and also may applied for cancer therapy. For example, estrogen therapy has been the standard treatment for advanced prostate cancer for several decades; however, it has currently been replaced by alternative anti-androgenic therapies. [7],[8] The studies have shown a relationship between steroids and cancer occurrence, treatment or complications.[9]-[11]

The main aim of this study was to determine the effects of the testosterone on the proliferation of AGS human gastric cancer cells in cell culture.

2. Material and Methods

100 mg/ml of testosterone was provided and sterilized using a syringe filter with an orifice of 200 micrometers. Different concentrations of hormone were provided using cell culture medium. The cytotoxic effects of different concentrations of hormone on AGS human gastric cancer cells was studied. The toxicity effect of testosterone on AGS cells was measured using MTT assay method. Finally, the data were analyzed using ANOVA.
3. Results

The findings showed that 0.05, 0.5, and 5 mg/ml of testosterone had toxic effect on AGS human gastric cancer cells (p<0.001, p<0.001, p<0.001, respectively) (Figure 1).

![Fig 1. Viability (%) of AGS cells exposed to different concentrations of testosterone. * and *** indicate significant difference compared with control group (P<0.01 and P<0.001, respectively).](https://doi.org/10.17758/URST.U0917239)

4. Discussion

We have shown that appropriate doses of testosterone have cytotoxic effects on AGS human gastric cancer cells. In line with our findings there are studies showing interrelation between various cancers and sex steroid hormones, in particular androgens. [12], [13] It has also been shown that testosterone level in patients is associated with complications or malignant tumor occurrence rate. [14], [15] The researchers also have found a link between colon and stomach cancer development and testosterone and other sex steroids. [16]-[18] Androgen receptors have also been indicated as targets in treatment of some types of cancers. [19],[20] Further research are needed to clarify the association between testosterone and stomach cancer cells proliferation. We are also investigating on molecular pathways involved in testosterone action on AGS human gastric cancer cells.

5. Conclusion

The results of this research suggest that appropriate doses of testosterone inhibit proliferation of AGS cells in cell culture.

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7. References


