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The effect of GWCBD, a cannabinoid extract on A2780 human ovarian carcinoma cells

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Introduction

In recent years, the anti-tumour potential of cannabinoids has highlighted the importance of this system in the generation of new anti-cancer therapies (Freimuth et al., 2010; Patsos et al., 2005). The aim of the present study was to investigate the potential anti-tumour activity of a cannabinoid extract rich in cannabidiol on ovarian tumour cells.

Method

A2780 cells, a human ovarian cell line, were grown and maintained in RPMI 1640 medium supplemented with 10% fetal bovine serum at 37^{o}C, 5% CO_2 .The cells were plated in 96-well culture plates at a density of $1x10^4$ cells/well and allowed to adhere at 37^{o}C for 24 hours. The following day, various doses of extract or vehicle control, in the absence and presence of AM251, AM630, T0070907 and capsazepine, were added to the cells and further incubated for 3 days. Then the supernatant was removed and MTT (3-(4,5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide) was added for 4 hours. The ability of cells to form formazan crystals by active mitochondrial respiration was determined by using a Microplate reader after dissolving the crystals in DMSO. Cytotoxicity was expressed as a relative percentage of the absorbance measured at 540 nm in the control and extract-treated cells. Data were presented as the mean $\pm$ s.e.mean and analysed using ANOVA followed by Dunnet's t-test; n=4.

Results

The extract induced dose-dependent cytotoxic effects on A2780 cells with an IC50 of 8.75±1.4 μM. Interestingly, the cytotoxicity was potentiated by the application of AM251, AM630, T0070907 and capsazepine with an IC50 of 0.3±0.23μM, 0.4±0.20 μM, 0.39±0.12 μM and 0.8±0.46 μM respectively. Single application of antagonists alone did affect the survival rate of the A2780 cells but not the vehicle.

Conclusion

The data confirms that the cannabinoid system is involved in the apoptosis of A2780 tumour cells. Further experiments are required to investigate the receptor type/subtypes involvement and the mechanism of cell death.

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References

Freimuth N et al., (2010) J of Pharmacology and Exp Ther 332: 336-344.

Patsos HA et al., (2005) Biochem Soc Trans 33: 712-714.