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The effect of imatinib mesylate and paclitaxel on tumorigenic cells via metalloproteinase ADAM9 biomarker through MTT and immunofluorescence assay

Vestibular schwannomas (VS) are brain tumourd that grow from an overaccumulation of Schwann cells on the VIIIth cranial nerve. It has been found that higher concentrations of the metalloprotease ADAM9 are expressed in neoplasmic schwannomas so the protein will serve as a biomarker in the following study. Currently, treatment options are highly invasive surgery that can cause deafness and chronic tinnitus or radiation that can cause cancer. A pharmaceutical alternative could greatly impact the quality of patients' lives because it provides a non-invasive, non-carcinogenic treatment modality for those suffering from VS. Numerous studies have found that early treatment minimizes chronic adverse effects of the tumour. Paclitaxel (P) and imatinib mesylate (IM) are apoptotic agents which prevent cell proliferation. They also decrease tumour mass and minimize angiogenesis in neoplasmic cells, respectively. A NCI-H1299 cell line served as a cell model where it was exposed to numerous concentrations of apoptotic drugs: 2mM (I), 100μM (P), 2mM (I) +100μM (P), 2mM (I) + 20μM (P), and 500μM (I) + 20μM (P). The cells were exposed to the drugs for 24 hours then immunofluorescence was performed with an ADAM9 probe and DAPI stain. Through qualitative assessment, the highest levels of apoptosis were exhibited in the cells treated with 100μM (P) and 2mM (I) +100μM (P). ADAM9 was visible, but a stronger microscope is needed for precise analysis. The same procedure was applied with the doses: 500μM (I), 100μM (P), 500μM (I) +100μM (P), and 500μM (I) + 20μM (P) due to drug availability. The treated cells were then used to perform an MTT assay, and the results were run in a t-test and ANOVA. It was found that there was only significance between the 500μM (I) + 20μM (P) cells in the t-test; all other results were statistically insignificant. Future research would likely benefit from pursuing another drug to pair with P, likely demonstrating higher amounts of apoptosis.

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