DETECTION AND QUANTIFICATION OF FRAGMENTED DNA IN BREAST CANCER CELL LINE TREATED WITH NEWCASTLE DISEASE VIRUS (NDV)

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Introduction: Breast cancer is the malignant tumour that developed from cells of the breast, and is the first leading cause of cancer death among women globally. Surgery, radiotherapy, and chemotherapy are the available treatment for breast cancer, but these were reported to have some side effects. Newcastle disease virus (NDV), also known as avian *paramyxovirus* type-1, APMV-1 is belonging to the genus *Avulavirus* in a family *Paramyxoviridae*. The virus is of economic important to the poultry industry as it results to significant damages on the brain, gastrointestinal and respiratory tracts of chickens. However, exposure to human results in a mild conjunctivitis, laryngitis and influenza-like symptoms. NDV showed promising as an anti-cancer agent, killing tumour cells while sparing normal cells unharm. Several strains of NDV such as 73-T, MTH68 and HUJ have been shown to posses the ability to kill cancer cells. Additionally, three (3) Malaysian strains, AF2240, S and V4, have also been studied on different cancer cell lines. Therefore, our main objective was to investigate whether inhibition of proliferation, and apoptosis-inducing effects of NDV AF2240 strain, may serve as a mechanism that enhance its oncolytic activity on MDA-MB-231 breast cancer cell line. **Methodology:** In this study, IC_{50} ($2^{4.7}$ or 25.99HAU) titre of NDV AF2240 virus were used to treat MDA-MB-231 breast cancer cell line *in vitro*.The oncolytic efficiency of this virus in apoptosis-inducing effects was evaluated by detection and quantitation of the DNA strand break of the apoptotic cells, being the landmark of apoptosis using flowcytometry, following Apo-BrdU *in situ* DNA fragmentation assay kit (BioVision, USA). **Results:** The virus induced apoptosis to cancer cells. In 24 hours treatment times, there were significant DNA fragmention as compare to control (*$p<0.05$). **Conclusion:** Although further exploration is needed, it appears that NDV AF2240 strain is a potent anti-cancer agent that induce apoptosis in time dependent manner. The apoptosis-inducing effects could be through breaking the DNA strand of the cancer cells which is one of the landmark of apoptosis.