Newcastle Disease Virus LaSota Strain Kills Human Pancreatic Cancer Cells in vitro with High Selectivity

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ABSTRACT
Context Pancreatic cancer is highly resistant to treatment. Previously, we showed that Newcastle disease virus (NDV) strain 73-T was highly cytotoxic to a range of tumor types in vitro and in vivo but the effects of NDV on pancreatic tumors are unknown. We determined the cytotoxicity of the lentogenic LaSota strain of NDV (NDV-LS) toward 7 different human pancreatic tumor cell lines and 4 normal human cell lines (keratinocytes, fibroblasts, pancreatic ductal cells, and vascular endothelial cells). Methods Cytotoxicity assays used serially diluted NDV incubated for 96 hours post-infection. Cells were fixed, stained, and minimum cytotoxic PFU (plaque forming unit) doses were determined (n=10-24/cell line). Results Normal cells were killed only by high doses of NDV-LS. The cytotoxic doses for pancreatic ductal cells, fibroblasts, and vascular endothelial cells were 729, 626, and 1217 PFU, respectively. In contrast, most pancreatic cancer cells were killed by much lower doses. The doses for PL45, Panc10.05, PANC-1, BxPC3, SU.86.86, Capan-1 and CFPAC-1 were 0.15, 0.41, 0.43, 0.55, 1.30, 17.1 and 153 PFU, respectively. Conclusions Most pancreatic tumor cells were >700 times more sensitive to NDV-LS killing than normal cells. Such avirulent, lentogenic NDV strains may have therapeutic potential in the treatment of pancreatic cancers.