

P075 The neuroprotective effect of Nerve Growth Factor (NGF) on 6-hydroxydopamine (6-OHDA)-treated PC12 cells

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6-OHDA is a neurotoxin that is commonly used to mimic Parkinson's Disease. The present study investigated the possible neuroprotective effect of NGF against 6-OHDA-induced cell death in PC12 cells. 6-OHDA treatment of PC12 cells caused both apoptotic (13.4%) and necrotic (12.9%) morphology that were, in both cases, significantly greater than in the corresponding controls (0.8% and 1.5%, respectively). Caspase-3 activity was increased (1.2 $\mu\text{mol}/\text{min}/\text{mg}$; $p < 0.001$) in 6-OHDA-treated cells compared to the control (0.29 $\mu\text{mol}/\text{min}/\text{mg}$). Furthermore, the active form of caspase-3 and the cleaved form of PARP were both detected in lysates of 6-OHDA-treated cells. This indicated that apoptosis was occurring in response to the 6-OHDA insult. 6-OHDA treatment was found to cause an increased release of the cytosolic marker, LDH, (61.4% of the positive control) into the culture medium indicating necrosis was also occurring.

Pretreatment of cells with NGF for 24 h was found to protect PC12 cells from the toxicity of 6-OHDA, as assessed morphologically (3.1% apoptosis and 4.5% necrosis; $p < 0.001$). Caspase-3 activity was reduced to 0.52 $\mu\text{mol}/\text{min}/\text{mg}$ in the presence of NGF ($p < 0.01$), and Western immunoblots of activated caspase-3 and cleaved PARP showed a pronounced reduction in proteolysis. LDH release was also reduced in the presence of NGF (26.1% of the positive control; $p < 0.001$). Thus, NGF appears to be neuroprotective against the induction of both apoptosis and necrosis in PC12 cells exposed to 6-OHDA.