ANTIOXIDANT AND PROLIFERATIVE ACTIVITIES OF BUPLEURI RADIX EXTRACT AGAINST SERUM DEPRIVATION IN HUMAN DOPAMINERGIC SH-SY5Y CELLS

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Introduction and aims: Bupleuri Radix (BR) is a major component of several oriental herbal medicines used to treat neuropsychiatric diseases. It is not clear whether BR modulates oxidative damage implicated in the pathophysiology of neurodegenerative disease, including Parkinson disease. The present study was conducted to investigate neuroprotective effects of BR on serum deprivation-induced oxidative stress in dopaminergic SH-SY5Y cells.

Methods: SH-SY5Y cells were treated with an aqueous BR extract (10–1000 ug/ml). We examined the antioxidant effects of BR on cell viability, formation of reactive oxygen species (ROS), superoxide dismutase (SOD) activity and expression levels of both Bcl-2 and Bax. We also investigated the effects of BR on cell proliferation, and used Western blot analysis to measure changes in expression of the cell cycle phase regulators cyclin D1, phosphorylated retinoblastoma (pRb) and p27.

Results:

1) Serum deprivation significantly induced the loss of cell viability, the formation of ROS, the reduction of SOD activity, down-regulation of Bcl-2 expression and up-regulation of Bax expression.

2) Serum deprivation significantly reduced cell proliferation. Western blot analysis revealed that serum deprivation significantly decreased cyclinD1 and pRb expression (positive cell cycle regulators), and increased p27 expression (negative cell cycle regulator). However, treatment with BR extract reversed all these effects caused by serum deprivation in dose-dependent manner.

Conclusions: These results suggest that aqueous extract of BR may exert potent antioxidant and proliferative effects in oxidative stress-induced neurodegenerative diseases.