Neuroprotective effect by Dammishimgyu herbal acupuncture against H$_2$O$_2$-induced apoptosis in human neuroblastoma, SH-SY5Y cells

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Background: The free radical is involved in neuronal cell death in human neurodegenerative disease. Dammishimgyu (DMSG) herbal acupuncture has been used to treat neurological disorders in Korea. The present study was aimed to investigate the neuroprotective effect of DMSG-herbal acupuncture against H$_2$O$_2$-induced apoptosis in human neuroblastoma cell line, SH-SY5Y.

Methods: The neuroprotective effect of DMSG-herbal acupuncture on H$_2$O$_2$-induced apoptosis was investigated by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay, 4’6-diamidino-2-phenylindole (DAPI) staining, reverse transcription-polymerase chain reaction (RT-PCR), Western blots and nitrite assay.

Results: In this study, 100 mM H$_2$O$_2$-treated cells decreased the cell viability with apoptotic features and increased the production of nitric oxide (NO). However, 0.1% DMSG treatment after exposure to 100 mM H$_2$O$_2$ inhibited both H$_2$O$_2$-stimulated mRNA and protein expressions of BCL2-associated X protein (BAX) and caspase 3 apoptosis-related cysteine peptidase (CASP3). In addition, 0.1% DMSG treatment inhibited the increased NO production induced by H$_2$O$_2$.

Conclusion: These results suggest that DMSG-herbal acupuncture shows protective effect against H$_2$O$_2$-induced neuronal damage. [Neurol Res 2007; 29: S93-S97]

Keywords: Herbal acupuncture; Dammishimgyu; apoptosis; neuroprotection; SH-SY5Y

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