

Heat Shock Protein 70 Attenuates Cisplatin Induced Caspase Activation and Apoptosis in Cultured Tubular Cells

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Background : Heat shock protein 70 (HSP 70) is a heat inducible protein which has cytoprotective effect from various stimuli. From recent reports that beneficial effect of heat preconditioning is mediated by inhibitory effect on NF- κ B that plays main role in inflammation and apoptosis, it could be suggested that HSP 70 has also protective effect in cisplatin induced renal injury mainly involved with inflammation and apoptosis. The aim of this study is to clarify the beneficial effect of heat preconditioning on cisplatin induced injury in cultured human kidney tubular (HK-2) cells.

Methods : Before cisplatin treatment, HK-2 cells were placed in hyperthermic (42°C) or normothermic (36°C) chamber for 1hr. The activation of caspase was measured by fluorometry and the activation of HSP 70, bax and bcl-2 were examined by western blot analysis.

Results : HSP 70 was increased by heat preconditioning with time dependent pattern. Caspase activation induced by cisplatin was inhibited by heat preconditioning. After cisplatin treatment, pro-apoptotic protein, bax was increased, while anti-apoptotic protein, bcl-2, and the ratio of bcl-2/bax were decreased. Heat preconditioning reverse these process related with apoptosis by cisplatin.

Conclusion : Thermal preconditioning confers protective effect on apoptosis caused by cisplatin in cultured tubular cells.