Sodium Hydrosulfide Attenuates Cisplatin-Induced Cell Death in Human Bone Marrow-Derived Mesenchymal Stem Cells

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Abstract

This study was to explore a mechanism by which hydrogen sulfide (H₂S) may protect human bone marrow-derived mesenchymal stem cells (hBM-MSCs) against cisplatin-induced apoptosis. hBM-MSCs were incubated with cisplatin, sodium hydrosulfide (NaHS) or U0126 (a specific MEK 1/2 inhibitor). Cell viability and the expression of phosphorylated and unphosphorylated ERK1/2 were examined in the treated cells, respectively. A decrease in hBM-MSC viability was seen with increasing doses of cisplatin as well as increasing time of cisplatin exposure. Treating cells with NaHS prior to cisplatin resulted in an increase in hBM-MSC survival and in the p-ERK1/2 expression level, suggesting that the increased survival was related to the expression level of the ERK1/2 protein. Treating cells with U0126 (a highly selective inhibitor for MEK1/2) not only reversed the effects of NaHS on the activation of ERK1/2 but antagonized the protective effect of NaHS on cisplatin-induced mortality of hBM-MSCs, su
suggesting that this agent influenced the cell’s response to NaHS through its effect on the ERK1/2 pathway. These findings indicate that NaHS protects hBM-MSCs against cisplatin-induced cell death through activation of the ERK1/2 pathway.