Pharmacological and Toxicological Effect of Hypothermia on Astrocyte。Taipei Medical University “2002 Academic of Joint Research Conference”, 2003.

邱文達

Pei-Yeh Chiang;Woon-Man Kung;Jia-Wei Lin;Yu-Ma Liu;Li Wei;Hsuen-Sen Liao;Cheuk-King Ng;Wen-Ta Chiu

Abstract

Hypothermia was a neuroprotective agent under ischemia brain. Clinical application of hypothermia treatment on neurosurgical and cardiovascular surgery are common. But basic study about the hypothermia effect on glial cell was rare. The aim of this study was to evaluate the effect of hypothermia on rat C6 glioma cell. Rat C6 glioma cells were cultured at 5 % CO2 incubator. The degree of hypothermia was defined as mild(35 ℃), moderate(32 ℃), and deep(26 ℃). Rat C6 glioma cells were cultured at various degree of hypothermia for 2、4、 6 hours. We used trypan blue exclusion method and MTT assay to evaluate the cell viability. The cell size was determined by confocal microscopy. The expression of glial fibrilary acidic protein and nerve growth factor mRNA by Reverse-Transcriptase Polymerase Chain Reaction (RT-PCR) analysis was test to evaluate the pharmacological effect of deep hypothermia. No direct cytotoxicity on C6 glioma cell at mild and moderate hypothermia was observed. Deep hypothermia decreased cell viability at 2、4、6 hours. Decrease in cell size during deep hypothermia treatment under confocal microscope was obvious at 2、4、6 hours. Increased expression of GFAP mRNA at 2、4、6 hours of deep hypothermia and decreased expression of NGF mRNA at 4、6 hours of deep hypothermia was also noted. We concluded that deep hypothermia not only had a direct cytotoxicity on rat C6 glioma cell but also had negative effect on the CNS via decrease the expression of nerve growth factor and increase the expression of glial fibrilary acidic protein.