Protective effects of tetramethylpyrazine on kainate-induced excitotoxicity in hippocampal culture

柯翠玲

Shih YH;Wu SL;Chiou WF;Ku HH;Ko TL;Fu YS

摘要

Abstract

Tetramethylpyrazine (TMP) is the major component extracted from the Chinese herb, Chuanxiong. This study focuses on the protective effect of tetramethylpyrazine in kainate-induced excitotoxicity in rat hippocampus. Primary neuronal cultures raised from cells isolated from the hippocampi of 7-day old rats were treated with kainate (75-450 microM) for 12, 24, and 48 h. Our results revealed that kainate induced neuronal damage in a dose- and time-dependent manner, reaching maximal damage at 150 microM and 24 h and persisted for higher doses and 48 h. In addition, 1 h of kainate (150 microM) treatment led to significant generation of free radicals and reduction of mitochondrial membrane potential (MMP) which persisted for > or = 4 h on continued exposure. Ten minutes pretreatment with 1 or 5 microM tetramethylpyrazine dose dependently and significantly attenuated the kainate-induced damage. Taken together, the results suggest that multiple mechanisms including protection of mitochondria, decrease in free radical generation and scavenging of free radicals might be involved in TMP's protection against kainate induced cell toxicity.