A potent antioxidant, lycopene, affords neuroprotection against microglia activation and focal cerebral ischemia in rats.

許準榕
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Abstract

We investigated the effects of a potent antioxidant, lycopene, on the free radical-scavenging activity as evaluated by the DPPH test and lipid peroxidation in rat brain homogenates as well as nitric oxide (NO) formation in cultured microglia stimulated by lipopolysaccharide. In addition, we also investigated the therapeutic effect of lycopene in attenuating ischemia/reperfusion brain injury induced by middle cerebral artery (MCA) occlusion in rats. Lycopene (1, 2 and 5 microM) exerted increased DPPH decolorization in the DPPH test, and increased inhibition of iron-catalyzed lipid peroxidation (TBARS formation) in rat brain homogenates in concentration-dependent manners. Furthermore, lycopene (5 and 10 microM) significantly inhibited nitrite production by about 31% and 61% in microglia stimulated by LPS, respectively. Rats which received lycopene at a dosage of 4 mg/kg, but not at 2 mg/kg, showed significant infarct size reductions compared with those which received the solvent control (20% Tween 80). In conclusion, we demonstrate a protective effect of lycopene on ischemic brain injury in vivo. Lycopene, through its antioxidative property, mediates at least a portion of free radical-scavenging activity and inhibits microglia activation, resulting in a reduction in infarct volume in ischemia/reperfusion brain injury.