

Conclusions These results demonstrated that lycopene protects against I/R-injury in vitro, which may be attributable to its roles in preventing ROS-mediated apoptosis.

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LYCOPENE PROTECTS CARDIOMYOCYTES AGAINST ISCHAEMIA/REPERFUSION-INJURY BY PREVENTING APOPTOSIS

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Objectives Reactive oxygen species (ROS)-mediated calpain activation has shown to play an important role in cardiomyocyte apoptosis. Lycopene is a natural antioxidant carotenoid that has been shown to have protective properties on cardiovascular system. However, whether lycopene can protect cardiomyocytes from ischaemia/reperfusion (I/R) injury, and the mechanisms of lycopene's effects are not clear.

Aim The purpose of this study was to investigate whether lycopene could efficiently protect against I/R-injury, and to elucidate the possible mechanism of its actions.

Methods Cultured cardiomyocytes from neonatal C57BL/6 mice were exposed to 4 h hypoxia followed by 8 h reoxygenation to simulate I/R-injury. Cardiomyocytes were divided into three groups: control, I/R, I/R+lycopene group (0.5 μ M lycopene pretreated for 4 h before I/R). The apoptosis index of cardiomyocytes was counted by comparing TUNEL-positive counts with the total cell nuclei determined by Hoechst 33342 counterstaining. The intracellular ROS levels were quantified by determination of intracellular oxidant production based on the oxidation of 2',7'-dichlorofluorescein diacetate (DCFH-DA), and the activity of caspase-3 was also determined in these groups.

Results The apoptosis index was significantly increased in I/R group compare to control, and decreased in I/R+lycopene group (10.37 \pm 1.25%, 32.03 \pm 4.79% and 22.57 \pm 3.22%, respectively). The intracellular ROS level in I/R group was higher compared to control and lower in I/R+lycopene group (1.05 \pm 0.12, 2.40 \pm 0.27 and 1.88 \pm 0.18, respectively). The caspase-3 activity in I/R group was significantly increased compared to control and decreased in I/R+lycopene group (1.02 \pm 0.19, 2.27 \pm 0.64 and 1.42 \pm 0.19, respectively).