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Molecular basis of cardioprotective effect of antioxidant vitamins in myocardial infarction.

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Abstract

Acute myocardial infarction (AMI) is the leading cause of mortality worldwide. Major advances in the treatment of acute coronary syndromes and myocardial infarction, using cardiologic interventions, such as thrombolysis or percutaneous coronary angioplasty (PCA) have improved the clinical outcome of patients. **Nevertheless, as a consequence of these procedures, the ischemic zone is reperfused, giving rise to a lethal reperfusion event accompanied by increased production of reactive oxygen species (oxidative stress).** These reactive species **attack biomolecules such as lipids, DNA, and proteins enhancing the previously established tissue damage, as well as triggering cell death pathways.** Studies on animal models of AMI suggest that lethal reperfusion accounts for up to 50% of the final size of a myocardial infarct, a part of the damage likely to be prevented. Although a number of strategies have been aimed at to ameliorate lethal reperfusion injury, up to date the beneficial effects in clinical settings have been disappointing. **The use of antioxidant vitamins could be a suitable strategy with this purpose.** In this review, we propose a systematic approach to the molecular basis of the cardioprotective effect of antioxidant vitamins in myocardial ischemia-reperfusion injury that could offer a novel therapeutic opportunity against this oxidative tissue damage.