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Chronic Treatment with Oleuroperin Protects from the Oxidative Damage the Reperfused Myocardium and Reduces the Myocardial Infarct Size in Rabbits

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AIM

Oleuropein is a phenolic antioxidant, which is present in elevated concentration in olives and olive oil. There is evidence that oxygen-derived free radicals produced upon reperfusion of ischemic myocardium represent the predominant cause of lethal reperfusion injury. The aim of the present study was to evaluate the efficacy of chronic treatment with oleuropein in two dosages in reducing the myocardial infarct size after sustained ischemia-reperfusion in rabbits and to evaluate its efficacy against the oxidative damage.

MATERIALS-METHODS

Twenty eight rabbits were subjected in 30 min regional ischemia followed by 180 min of reperfusion. Rabbits were randomly assigned into 4 groups as follows: Control group (CTL): normal saline; OLEU-6-10: the rabbits received for a period for 6 weeks 10 mg/kg/ BW/day oleuropein; OLEU-6-20: the rabbits received for a period for 6 weeks 20 mg/kg/BW/day oleuropein; OLEU-3-20: the rabbits received for a period for 3 weeks 20 mg/kg/BW/day oleuropein. Infarct (I) and risk areas R were delineated with Zn-Cd particles and triphenyl tetrazolium chloride (TTC). The infarcted, the risk and the normal areas were quantified by planimetry with the aid of a digitizer. Infarcted and risk area volumes were expressed as cm^3 and the percent of infarct to risk area (I/R) calculated. Blood samples were drawn at different time points for determination of malondialdehyde (MDA) as an index of lipid peroxidation, for total superoxide dismutase (SOD) activity as an index of the antioxidant status and for ^{1}H-NMR spectra for the evaluation of the changes in the metabolic profile.

RESULTS

Treatment for 6 and /or 3 weeks with oleuropein reduced significantly the myocardial infarct size in both dosages tested. Lipid peroxidation product levels were significantly elevated in the control group, whereas oleuropein decreased them in both doses. The SOD activity was reduced significantly in the control group; oleuropein kept SOD activity unchanged during ischemia-reperfusion. No significant changes were observed in the low molecular weight metabolites according to NMR spectra.

CONCLUSION

Chronic treatment for 3 or 6 weeks with 2 doses of oleuropein decreases significantly the myocardial infarct size, and protects the reperfused myocardium from the oxidative damage *in vivo*.