Cerivastatin and hypercholesterolemia reduce apoptosis of cardiomyocytes in guinea pig papillary muscle subjected to hypoxia/reoxygenation

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Abstract:
The aim of this study was to assess how cerivastatin influences contractility and degree of myocardial damage in papillary muscle subjected to hypoxia-reoxygenation in hypercholesterolemic guinea pigs. Study group consisted of guinea pigs, fed standard, hypercholesterolemic or hypercholesterolemic diets with low dose of cerivastatin. During experimental hypoxia-reoxygenation, the contractility was measured. Apoptosis of cardiomiocytes was assessed with the use of TUNEL technique. Total cholesterol in standard, hypercholesterolemic and cerivastatin-treated group was 35 ± 8 mg/dl, 131.6 ± 30.4 mg/dl and 121.2 ± 26.2 mg/dl, respectively, and was significantly higher in rats fed hypercholesterolemic and hypercholesterolemic + cerivastatin diets than in control group (p < 0.01). There were no significant differences between all analyzed groups in the post-ischemic cardiac function. Percentage of apoptotic cells after hypoxia-reoxygenation injury in groups fed standard, hypercholesterolemic and hypercholesterolemic + cerivastatin diets was 30 ± 8%, 20 ± 4% and 5 ± 7%, respectively, and was significantly lower in groups that received hypercholesterolemic (p < 0.01) and hypercholesterolemic + cerivastatin (p < 0.001) diets in comparison with standard diet-fed group. In the group treated with cerivastatin, the percentage of apoptotic cells was additionally lower in comparison with hypercholesterolemic group (p < 0.01). Negative correlation between percentage of apoptotic cells and HDL level was found when all groups were considered jointly (r = -0.41, p < 0.05). Our study clearly shows that cerivastatin in hypercholesterolemic animals and hypercholesterolemia itself limit cardiomiocyte damage after hypoxia-reoxygenation.

Key words: experimental hypoxia-reoxygenation, hypercholesterolemia, cerivastatin, apoptosis