CERIVASTATIN MODULATES PLASMA PARAOXONASE/ARYLESTERASE ACTIVITY AND OXIDANT-ANTIOXIDANT BALANCE IN THE RAT

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Statins (3-hydroxy-3-methylglutarylcoenzyme A reductase inhibitors), apart from lowering plasma cholesterol, modulate other processes involved in atherogenesis. Paraoxonase (PON), contained in plasma high density lipoproteins, protects plasma lipoproteins from oxidative damage and is a potentially atheroprotective enzyme. We investigated the effect of cerivastatin on oxidant-antioxidant balance and plasma PON activity. The adult male Wistar rats received cerivastatin at a dose of 0.03 or 0.3 mg/kg/day for 3 weeks. Then, plasma concentration of lipid peroxidation products, total antioxidant capacity and PON activity were assayed. Plasma level of lipid peroxidation products was unchanged in low-dose group but decreased significantly in animals receiving high dose of cerivastatin. In this group, the concentration of malonyldialdehyde and 4-hydroxyalkenals was reduced by 46.6% whereas the level of lipid hydroperoxides was lowered by 59.3%. Total plasma antioxidant capacity increased in low-dose group by 22.3% and in high-dose group by 27.2%. PON activity toward paraoxon decreased by 16.1% and 11.6% in low- and high-dose groups, respectively. The activity toward phenyl acetate, which better corresponds with enzyme concentration, declined by 74.2% and 78.4% following lower and higher dose treatment, respectively. PON/arylesterase ratio raised in cerivastatin-treated rats (low dose: +227.4%, high dose: +328.2%). Cerivastatin had no effect on total plasma cholesterol but significantly decreased triglyceride level by 34.6% in low-dose and by 31.2% in high-dose group. These results indicate that cerivastatin decreases the level of oxidative stress, improves plasma antioxidant defense and modulates paraoxonase activity. These effects can contribute to pleiotropic actions of statins in the cardiovascular system.

Key words: cerivastatin, paraoxonase, lipid peroxidation, oxidative stress

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