Effect of Oxidized LDL on Erythrocyte Nitric Oxide Metabolism

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Aims: Oxidized low density lipoprotein (ox-LDL) has been reported as an inhibitor of nitric oxide (NO)-mediated dilatation in microcirculation. Oxidized LDL effect on NO metabolism of erythrocytes is not known. Therefore, this study aims to evaluate the effect of ox-LDL on erythrocytes NO metabolism.

Methods: The effect of different concentrations of human purified ox-LDL (25, 50 and 100 mg/mL) on NO metabolism was evaluated on erythrocytes suspensions of healthy subjects.

Results: An inhibitory effect of higher concentrations of ox-LDL on erythrocyte NO efflux was verified. NO efflux his lower as consequence of treatments with ox-LDL 50 mg/mL (1.6±0.27 nM) and 100 mg/mL (1.3±0.22 nM) concentrations than control aliquot (1.9±0.28 nM). No difference was verified in comparison to positive control, acetylcholine (ACh; 1.7±0.21 nM). By the contrary, ox-LDL incubation has a positive effect on GSNO content of erythrocytes. That effect is proportional to concentrations of ox-LDL (10.8±1.4 nM for 25 mg/mL, 12.9±1.5 nM for 50 mg/mL and 12.1±1.9 nM for 100 mg/mL) and is significant relative to control (8.56±0.76 mM) and ACh (8.9±0.52 mM) aliquots.

Conclusions: Presence of oxidized LDL in erythrocyte NO metabolism induces a decrease of NO efflux amount and an increase on intra-erythrocyte GSNO concentrations. These results suggest a role of ox-LDL in mobilization of NO between NO derivatives molecules in dependence of oxidized LDL concentration.