Low concentration of oxidized low density lipoprotein suppresses platelet reactivity in vitro: an intracellular study

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摘要

Abstract

The intracellular mechanisms underlying oxidized low density lipoprotein (oxLDL)-signaling pathways in platelets remain obscure and findings have been controversial. Therefore, we examined the influence of oxLDL in washedhuman platelets. In this study, oxLDL concentration-dependently (20-100 μg/mL) inhibited platelet aggregation in human platelets stimulated by collagen (1 μg/mL) and arachidonic acid (60 μM), but not by thrombin (0.02 U/mL). The activity of oxLDL was greater at 24 h in inhibiting platelet aggregation than at 12 h. At 24 h, oxLDL concentration-dependently inhibited intracellular Ca2+ mobilization and thromboxane B2 formation in human platelets stimulated by collagen. In addition, at 24 h oxLDL (40 and 80 μg/mL) significantly increased the formation of cyclic AMP, but not cyclic GMP or nitrate. In an ESR study, 24 h-oxLDL (40 μg/mL) markedly reduced the ESR signal intensity of hydroxyl radicals (OH.-) in both collagen (2 μg/mL)-activated platelets and Fenton reaction (H2O2 + Fe2+). The inhibitory effect of oxLDL may induce radical-radical termination reactions by oxLDL-derived lipid radical interactions with free radicals (such as hydroxyl radicals) released from activated platelets, with a resultant lowering of intracellular Ca2+ mobilization, followed by inhibition of thromboxane A2 formation, thereby leading to increased cyclic AMP formation and finally inhibited platelet aggregation. This study provides new insights concerning the effect of oxLDL in platelet aggregation.