Ginkgo biloba Extract Inhibits Tumor Necrosis Factor- -induced Reactive Oxygen Species Generation, Transcription Factor Activation, and Cell Adhesion Molecule Expression in Human Aortic Endothelial Cells.

林豐彥

Chen JW;Chen YH;Lin FY;Chen YL;Lin SJ;林豐彥

摘要

Abstract

Objective— This study was conducted to examination whether Ginkgo biloba extract (GBE), a Chinese herb with antioxidant activity, could reduce cytokine-induced monocyte/human aortic endothelial cell (HAEC) interaction, a pivotal early event in atherogenesis.

Methods and Results— Pretreatment of HAECs with GBE (50 and 100 µg/mL for 18 hours) significantly suppressed cellular binding between the human monocytic cell line U937 and tumor necrosis factor- (TNF-)-stimulated HAECs by using in vitro binding assay (68.7% and 60.1% inhibitions, respectively). Cell enzyme–linked immunosorbent assay and immunoblot analysis showed that GBE (50 µg/mL for 18 hours) significantly attenuated TNF-–induced cell surface and total protein expression of vascular cellular adhesion molecule-1 and intracellular adhesion molecule-1 (63.5% and 69.2%, respectively; P<0.05). However, pretreatment with probucol (5 µmol/L for 18 hours) reduced the expression of vascular cellular adhesion molecule-1 but not intracellular adhesion molecule-1. Preincubation of HAECs with GBE or probucol significantly reduced intracellular reactive oxygen species formation induced by TNF- (76.8% and 68.2% inhibitions, respectively; P<0.05). Electrophoretic mobility shift assay demonstrated that both GBE and probucol inhibited transcription factor nuclear factor-B activation in TNF-–stimulated HAECs (55.2% and 65.6% inhibitions, respectively) but only GBE could inhibit the TNF-–stimulated activator protein 1 activation (45.1% inhibition, P<0.05).

Conclusions— GBE could reduce cytokine-stimulated endothelial adhesiveness by downregulating intracellular reactive oxygen species formation, nuclear factor-B and activator protein 1 activation, and adhesion molecule expression in HAECs, supporting the notion that the natural compound Ginkgo biloba may have potential implications in clinical atherosclerosis disease.

Key Words: activator protein 1 • cell adhesion molecule • Ginkgo biloba • human aortic endothelial cells • nuclear factor-B