Salvianolic acid B Inhibits Stromal Cell-Derived Factor-1/CXCR4 Axis and Promotes Apoptosis on Vascular Smooth Muscle Cells

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We attempt to explore whether salvianolic acid B (Sal.B) can inhibit SDF-1α-induced biological effects on vascular smooth muscle cells (VSMCs). Cellular effects of Sal.B on cell proliferation and migration were investigated in A10 cells by MTT assay, wound-healing assay and flow cytometry. The regulation of ERK-MAPK pathway, apoptosis-associated proteins, FAK, CXCR4 and SDF-1α were determined. The apoptotic effect of Sal.B was also examined by DNA ladder assay and cell cycle analysis on cultured VSMCs. Furthermore, the luciferase-based assay was used to measure the promoter activity of NF-κB on cultured VSMCs stimulated by 10 $ng.mL^{-1}$ SDF-1α and/or 0.075 $mg.mL^{-1}$ Sal.B. SDF-1α stimulated cell proliferation and migration, which can be significantly inhibited by Sal.B. The up-regulation of CXCR4, FAK, phosphor-FAK, Raf-1, MEK, ERK1/2 and phospho-ERK1/2 induced by SDF-1α was also markedly decreased by Sal.B. Additionally, Sal.B markedly increased Bcl-2 but decreased caspase-3 leading to apoptosis in a dose-dependent manner. SDF-1α-mediated increase of NF-κB promoter activity was suppressed by Sal.B treatment. The inhibitory and apoptotic effects of Sal.B on SDF-1α-triggered proliferation and migration of VSMCs were exerted through decreasing CXCR4 expression and its downstream pathways, and activating caspase-dependent apoptosis pathway.