Vascular medicine

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TROGLITAZONE INCREASED HUMAN CORONARY ARTERY SMOOTH MUSCLE CELLS PROLIFERATION BUT INHIBITED THE APOPTOSIS THROUGH THE PPAR γ

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Background TZDs (thiazolidinediones) are a class of antidiabetic drugs extensively used in the treatment of diabetes mellitus type 2. As ligands of PPAR γ (peroxisome proliferators-activated receptor γ), TZDs have antiproliferative and pro-apoptotic functions on human coronary artery smooth muscle cells (HCASMCs, also called vessel smooth muscle cells, VSMCs), leading to prevent the formation and progression of atherosclerosis as well as restenosis following percutaneous coronary intervention (PCI). However, the mechanisms by which TZDs prevent atherosclerosis and restenosis are still unclear. In this study, we determine the effects of the troglitazone, one of TZDs on the apoptosis and proliferation in VSMC.

Methods Using the PPAR γ agonist troglitazone treated the VSMCs, the authors determined if activation of PPAR γ by troglitazone modulated the proliferation and apoptosis in VSMCs. Moreover, using PPAR γ antagonist GW9662, overexpressing PPAR γ by an adenoviral vector, or silencing PPAR γ by PPAR γ SiRNA, we further determined the mechanisms whereby troglitazone regulated the proliferation and apoptosis in VSMCs.

Results Troglitazone treatment was able to significantly increase proliferation in VSMCs. A similar effect was observed in VSMCs overexpressed PPAR γ . In contrast, GW9662 treatment and silencing PPAR γ with PPAR γ SiRNA were able to markedly inhibit VSMCs proliferation. Furthermore,

troglitazone treatment and over-expressing PPAR γ caused an increased expression of caspase 3 and 9, and decreased expression of cyclinB1 and cyclinD1, suggesting that troglitazone treatment led to an inhibition of cell cycles.

Conclusions Troglitazone treatment increases VSMC cell proliferation by activating the PPAR γ signalling. Also troglitazone treatment decreases apoptosis of VSMCs by regulating the cyclins and caspase 3. Together the present study demonstrates troglitazone may be a potential medicine to prevent the restenosis following angioplasty of coronary artery through modulation of PPAR γ pathway.