Vascular medicine

[gw22-e0149]

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

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10.1136/heartjnl-2011-300867.709

Background TZDs (thiazolidinediones) are a class of antidiabetic drugs extensively used in the treatment of diabetes mellitus type 2. As ligands of PPARγ (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 PPARγ agonist troglitazone treated the VSMCs, the authors determined if activation of PPARγ by troglitazone modulated the proliferation and apoptosis in VSMCs. Moreover, using PPARγ antagonist GW9662, overexpressing PPARγ by an adenoviral vector, or silencing PPARγ by PPARγ 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 PPARγ. In contrast, GW9662 treatment and silencing PPARγ with PPARγ SiRNA were able to markedly inhibit VSMCs proliferation. Furthermore,

troglitazone treatment and over-expressing PPARγ 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 PPARγ 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 PPARγ pathway.