Angiotensin II triggers apoptosis in cardiac fibroblast but not in myofibroblast overexpressing the type 1 receptor

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The function of angiotensin II receptor type 1 and type 2 (AT1R and AT2R) on cardiac fibroblasts and myofibroblast viability in conditions where they are up-regulated is unknown. Using adenovirus we ectopically expressed the AT1R and AT2R in cultured rat cardiac fibroblasts and myofibroblast and investigated the effect on cell viability. Angiotensin II 100 nM, decreased the cell viability only in cardiac fibroblasts expressing AT1R. In cardiac fibroblast expressing the AT2R or myofibroblast expressing the AT1R or AT2R, no effect of Ang II 100 nM on cell viability was observed. Cell viability was linked to an early decrease (starting at 6 h) in mitochondrial membrane potential (ψMMP) in cardiac fibroblasts expressing AT1R. Cardiac fibroblast apoptosis, assessed by Propidium Iodine (PI), was detected 18 h after Ang II. Both ψMMP and apoptosis were blocked by Losartan 10μM, U73122 1μM, and Gö 68074 100nM. No differences in expression levels of bcl-2 and bax protein between cardiac fibroblast and myofibroblast were observed. However, Ang II only reduces the ratio bcl-2/bax in cardiac fibroblast. We conclude that Ang II trigger apoptosis in cardiac fibroblasts expressing AT1R by a PLC-PKC dependent signalling pathway by an early decrease in ψMMP.