Statin Ameliorates Coronary Perivascular Fibrosis in Chronic Kidney Disease: An Experimental Study

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Background

Cardiovascular disease is the major cause of morbidity and mortality in chronic kidney disease (CKD). Interstitial and perivascular fibrosis as a constant finding in heart biopsies in patients with CKD. The therapeutic strategies aimed to reduce cardiac fibrosis may provide a particular cardioprotective benefit in patients. The aim of this study was to determine whether treatment with simvastatin for 2 weeks would lead to change in collagen deposition on the heart in a mice model with CKD.

Methods

A total of 15 male swiss were used in this study. Chronic kidney disease was induced in the mice by 5/6 subtotal nephrectomy. The animals were randomized into three groups: sham-operated (SO, n=5), 5/6 subtotal nephrectomy (SN, n=5) and 5/6 subtotal nephrectomy followed by 20 mg/kgBW simvastatin (SIMV, n=5). After 2 weeks, blood and heart were harvested for histologic analysis.

Results

Administration of simvastatin significantly improved creatinine serum on SIMV group (0.49 ± 0.09 mg/dl) compared to SN group (1.92 ± 0.34 mg/dl). The collagen deposition was also more significant on SIMV group (8.95 ± 0.65 mg/dl) compared to SN group (16.64 ± 2.7 mg/dl). The collagen deposition was more prominent on coronary perivascular than that on interstitial myocardial.

Conclusions

Administration of 20 mg/kgBW simvastatin significantly improved coronary perivascular fibrosis.

Keywords: simvastatin, coronary fibrosis, chronic kidney disease