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Inhibition of Interleukin-1 Activity is related with Reduced Apoptosis and Improved Speckle Tracking Myocardial Deformation in Patients with Rheumatoid Arthritis

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INTRODUCTION

Studies have shown that inhibition of interleukin-1 (IL-1) activity improves myocardial deformation through reduction of nitro-oxidative stress and reduces the size of experimental myocardial infarction through reduction of cell apoptosis. We investigated whether inhibition of Il-1 activity reduces apoptosis and thus, improves myocardial deformation in rheumatoid arthritis patients (RA).

METHODS

In an acute, double-blind trial, 43 patients with RA were randomized to receive a single injection of anakinra, a recombinant IL-1 receptor antagonist, (150 mg s.c.) or placebo and after 48-hours were crossed over to the alternate treatment. At baseline and 3-hours after the single injection, we assessed a) LV longitudinal, circumferential and radial strain and strain rate, using speckle tracking echocardiography and c) Fas and caspase-9 serum levels, as apoptotic markers. Patients were reassessed after 30 days of anakinra treatment.

RESULTS

At 3 hours and 30 days after treatment, there was an significant reduction in Fas (541±403 vs. 416±373 vs. 378±200 pg/ml), caspase-9 (2.63±2.79 vs. 2.01±1.82 vs. 1.66±1.63 ng/ml) and Longitudinal SR (-1.02±0.23 vs -1.125±0.20 vs -1.25±0.23 l/s) compared to baseline ($p<0.05$ for all comparisons). No changes were observed after placebo. Baseline Fas predicted the absolute and %change of Longitudinal SR after 3 hrs and 30 days post anakinra ($r = -0.578$, $r = -0.603$, $r=-0.523$, $r=-0.588$, $p<0.05$). Absolute and % changes of caspase-9, 3 hours post-anakinra were also related to the absolute and %change in Longitudinal SR ($r=-0.583$, $r=-0.555$, $r=-0.564$, $r=-0.538$, $p<0.05$) Similar association were observed after 30 days of anakinra treatment.

CONCLUSION

The reduction of apoptosis is a potential mechanism for the improvement of myocardial deformation after inhibition of IL-1 activity.