Abstract: **P4435**

**Effects of interleukin 6 inhibitor tocilizumab on endothelial glycocalyx, vascular and myocardial function compared to prednisolone**

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**Topic(s):**
Autoimmune/Chronic Inflammatory Disorders and Heart Disease

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**Background/Introduction:**
Tocilizumab, a humanised monoclonal antibody against the human interleukin-6 receptor, is used for the treatment of rheumatoid arthritis (RA).

**Purpose:**
We investigated the effects of tocilizumab on arterial function, LV myocardial deformation and endothelial glycocalyx in RA patients.

**Methods:**
80 patients with rheumatoid arthritis were randomized to tocilizumab (n=40) or prednisolone (n=40) for 3 months. At baseline and after 3-month treatment we assessed: a) carotid-femoral pulse wave velocity (PWV-Complior SP ALAM), b) LV longitudinal strain (GLS), systolic (LongSr) and diastolic (LongSrE) strain rate using speckle tracking echocardiography, c) perfused boundary region (PBR) of the sublingual arterial microvessels (ranged from 5–25μm) using Sideview Darkfield imaging (Microscan, Glycocheck). Increased PBR is considered an accurate index of reduced endothelial glucocalyx thickness, d) flow mediated dilatation (FMD) of the brachial artery after and percentage difference of FMD (FMD%) after hyperemia, e) coronary flow reserve (CFR) of the LAD using Doppler echocardiography, and f) malondialdehyde (MDA), protein carbonyls (PCs) and C-reactive protein (CRP) plasma levels.

**Results:**
At baseline, all patients had similar disease activity score and markers of vascular and myocardial function. Compared to baseline, all patients had reduced CRP post treatment, while MDA and PCs levels were reduced only after tocilizumab treatment (p<0.05). The percent decrease of MDA was correlated with percent increase of GLS (p<0.001). Compared to baseline, tocilizumab-treated patients reduced PWV (11±3% vs. 10.3±2m/sec) and PBR (2.11±0.2 vs. 1.95±0.18μm) (Figure 1) and increased GLS (~16.1±2.9 vs. ~17.6±2.5%), CFR (2.73±0.8 vs. 3.06±1), and FMD% (5.9±2.9 vs. 11.6±3.6) (p<0.05 for all comparisons). No significant changes were observed among prednisolone-treated patients.

**Conclusions:** IL-6 inhibition improves endothelial function and oxidative stress resulting to improved vascular function and LV myocardial deformation.
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Figure 1