

## **Assessment of Aortic Stiffness by CMR Imaging in Systemic Autoimmune Rheumatic Diseases**

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Background: Systemic Lupus Erythematosus (SLE) and rheumatoid arthritis (RA) are known to cause premature arterial aging and early atherosclerosis hence leading to increased stiffness of the large arteries. Recently, CMRI was introduced as a new technique for assessment of aortic stiffness by measuring the Pulse Wave Velocity (PWV). Therefore, we aimed to assess aortic stiffness by CMRI in RA and SLE patients.

Methods: We prospectively recruited 14 SLE female patients, 14 RA female patients and a control group of 19 matching healthy female volunteers. Clinical and laboratory data were gathered. CMRI was performed using a 1.5T scanner and included phase contrast images of the ascending and the descending aorta. A dedicated cardiovascular analysis software was used to measure the flow at the level of the ascending and the descending aorta. The distance between these 2 levels was obtained and PWV was calculated accordingly.

Results: The mean age was  $54\pm 15$ ,  $39\pm 12$  and  $43\pm 14$  for the RA, SLE and the control group respectively,  $p<0.05$ . There was no difference in the rates of HTN, dyslipidemia, and smoking. DM was more frequent in the RA patients vs. SLE patients and controls, 29% vs. 4% and 9%, respectively,  $p<0.05$ . The mean systolic BP (mmHg) was  $133\pm 18$ ,  $117\pm 19$  and  $114\pm 15$  and the PWV was  $9.3\pm 5$ ,  $7.1\pm 3$  and  $6.8\pm 4$ ,  $p<0.05$  and  $p=0.07$ , respectively. The median PWV was 6.3 m/s. In a regression analysis only age and systolic BP were positively associated with PWV. A multivariate analysis also demonstrated that age is associated with higher than the median ( $>6$  m/s) PWV, OR 1.2 per 1 year. RA and SLE, each, only showed a trend toward association with higher than the median PWV but did not reach statistical significance.

Conclusions: Our initial results are in concordance with previous data that showed a positive association between age and systolic BP to PWV. Further analysis is needed to ascertain whether elevated PWV is also associated with autoimmune disease.