IMPAIRED CORONARY VASCULAR REACTIVITY IN CARDIAC SYNDROME X MEASURED NON-INVASIVELY BY 3T MRI

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Authors: Tonia Yee, Alice Chang, Melanie Kotys, Elizabeth Holper, Ron Peshock, UT Southwestern, Dallas, TX

Background: Cardiac syndrome X (CSX) describes women with chest pain, abnormal stress tests but no significant coronary stenoses by angiography. Impaired coronary vascular reactivity (CVR) predicts cardiovascular events in CSX. Non-invasive detection of impaired CVR could facilitate early diagnosis and risk stratification in CSX. We previously demonstrated significant increases in coronary flow (CF) in healthy women using 3T magnetic resonance imaging (MRI) and the cold pressor test (CPT). We sought to determine if women with CSX had impaired CVR compared to matched controls using MRI.

Methods: We recruited 7 women with CSX and 8 controls matched for cardiac risk factors. Using 3T MRI, baseline CF was obtained using a spiral, velocity-encoded, cine sequence perpendicular to the right coronary artery (spatial resolution=0.8 x 0.8 x 7 mm3, temporal resolution = 69 ms). Images were acquired during 2 min of CPT. Peak CF was measured during diastole.

Results: There was no significant difference in age, body mass index, prevalence of diabetes or baseline blood pressures between groups. There was no significant difference in % increase in rate pressure product to CPT (CSX 30.9% ± 14, controls 40.9% ± 28; p=0.67). During CPT, CSX women demonstrated a significant early decrease in CF (Fig. 1A), associated with increases in coronary vascular resistance not seen in controls (Fig. 1B).

Conclusion: Impairment in CVR is detectable non-invasively by 3T MRI with CPT in CSX women compared to risk factor matched controls.