Comparison of Non-Invasive Peripheral Vascular Function to Invasive Measures of Coronary Function in Patients with Suspected Coronary Microvascular Dysfunction

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Introduction: The purpose of this study is to compare non-invasive vascular assessments to invasive gold standard measures of coronary flow and resistance in patients with suspected coronary microvascular dysfunction (CMD), a condition driven by systemic endothelial dysfunction. We hypothesize that non-invasive measures will be associated with both coronary flow and resistance following pharmacological hyperemia. Methods: Forty-one patients with suspected CMD attended the Cardiovascular Integrative Physiology Clinic at Southlake Regional Health Centre. Patients underwent finger-based arterial tonometry (RH PAT) to non-invasively quantify microvascular endothelial function (EndoPAT). A subset of participants (n=15) also concurrently completed flow mediated dilation (FMD) of the brachial artery to assess conduit artery endothelial function. Briefly, a standard blood pressure cuff was positioned on the right arm of patients, distal to the elbow joint. Baseline recordings preceded 5 minutes of forearm ischemia, and was followed by cuff deflation, eliciting reperfusion. Within 4 months, patients underwent coronary reactivity testing using the Doppler guidewire method. Specifically, the coronary flow reserve (CFR), and the index of microvascular resistance (IMR) were calculated during pharmacologically-induced hyperemia using adenosine, then dobutamine. Results: RH PAT was negatively correlated to the IMR during dobutamine (r=−0.39, p=0.04), but not the CFR (r=0.14, p=0.49). FMD was negatively correlated to the IMR during adenosine (r=−0.64, p=0.01), but not the CFR (r=0.29, p=0.30). Conclusion: These preliminary results suggest that measures of non-invasive peripheral vascular function can predict pharmacologically induced changes in coronary resistance, but not coronary flow.