# What is Microvascular Angina? Is it Gender Specific?

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Angina in the setting of either non-obstructive coronary artery disease or "angiographically normal" coronary arteries can occur in patients who have chronic stable angina or present with unstable angina. The clinical finding of angina without obstructive coronary artery disease (CAD) is found in between 10-30% of individuals undergoing coronary angiography [1]. Furthermore, evidence of microvascular dysfunction can be found in 50-65% of these patients by evaluating coronary artery flow after giving intracoronary adenosine [2]. It is important to consider alternative causes for chest discomfort for patients with angina and non-obstructive CAD, such as microvascular angina. The pathophysiology of microvascular angina is incompletely understood, however is multifactorial and appears to be related to endothelial dysfunction, microvascular atherosclerosis, inflammation and smooth muscle dysfunction.

Coronary microvascular function can be evaluated by testing coronary blood flow at rest and following administration of adenosine for endothelium-independent vasodilation or acetylcholine for endothelium-dependent vasodilation. The difference between resting and hyperemic coronary blood flow is the coronary flow reserve. Non-invasive evaluation of microvascular dysfunction can be done with vasodilator stress perfusion cardiac magnetic resonance (CMR) or cardiac positron emission tomography (PET) imaging [3].

Cardiovascular risk factors of hypertension, hyperlipidemia, diabetes and tobacco use are related to the microvascular angina in the setting of non-obstructive coronary artery disease. However, the factors which cause microvascular angina in the setting of "angiographically normal" coronary arteries are not well understood. Conditions associated with low estrogen levels or being post-menopausal are also associated with microvascular angina. Epicardial fat thickness is an independent predictor of microvascular dysfunction in women [4].

Microvascular angina is more commonly diagnosed in women. Typically women with microvascular angina are menopausal. However, microvascular angina can occur across the life span and also in men. Women with angina and non-obstructive CAD compared to men with the same symptoms have a lower coronary flow reserve which appears to be related to differences in resting coronary flow [5]. In one study of women with "angiographically normal" coronary arteries were more than 4 times as likely to be readmitted to the hospital for acute coronary syndrome/chest pain than their male counterparts [6].

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