

# Angina With "Normal" Coronary Arteries

## A Changing Philosophy

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**Context** Many women with angina are told that they have no significant heart disease following demonstration of normal or near-normal coronary arteries and are offered no specific treatment beyond reassurance.

**Evidence Acquisition** MEDLINE and the Cochrane Database of Systematic Reviews were searched from their start dates until June 2004 for analysis using specific key words including *diagnosis and therapy of angina with normal angiography* and *angina with normal coronary arteries*. Reference lists of published articles and data of meeting presentations were also consulted.

**Evidence Synthesis** Normal or nonobstructive coronary disease at angiography is not uncommon and occurs in 10% of women presenting with ST-segment elevation myocardial infarction compared with 6% in men. Patients with evidence of myocardial ischemia or myocardial infarction and nonobstructive atherosclerotic disease of the coronary arteries are more likely to be women and nonwhite. Symptoms are often indistinguishable from those with obstructive coronary artery disease. The prognosis of patients with unstable angina and nonobstructive atherosclerotic coronary artery disease is not benign and includes a 2% risk of death or myocardial infarction at 30 days of follow-up. Recent work has shown that at least 20% of women with normal or nonobstructive angiography have myocardial ischemia, likely due to atherosclerosis-related endothelial dysfunction, which itself is associated with an increased risk of later adverse cardiac events and development of frank future obstructive disease. Randomized placebo-controlled studies have demonstrated that tricyclic antidepressants, -blockers,

angiotensin-converting enzyme inhibitors, L-arginine, statins, and exercise may relieve symptoms, vascular dysfunction, or both; however, longer-term studies evaluating cardiac event rates need to be performed.

**Conclusions** Patients with chest pain and normal or nonobstructive coronary angiograms are predominantly women, and many have a prognosis that is not as benign as commonly thought. Assessment of endothelial function may help identify patients at risk for future cardiac events. Therapy should be directed at symptom relief with tricyclic agents and  $\beta$ -blockers, and aggressive antiatherosclerotic therapy with statins, angiotensin-converting enzyme inhibitors, or both should be applied when risk factors are present or prognostic risk is high. Large-scale randomized trials need to be conducted to determine optimal ways of preventing clinical events.

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