

Coronary Artery Disease Prevention, Diagnosis, Prognosis and Treatment: What's Different for Women?

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Cardiovascular disease (CVD) is the leading cause of morbidity and mortality. Coronary heart disease (CHD) occurs in women a decade later compared with men and the gap between men and women narrows with advancing age. In addition, cardiovascular mortality declines in men but not in women. Coronary heart disease (CHD) accounts for the majority of CVD deaths in women.

The spectrum of CVD risk in women (10-year absolute CHD risk) varies from high (>20%) for women with established CHD, cerebrovascular disease, peripheral artery disease, abdominal aortic aneurysm, diabetes and chronic kidney disease to intermediate risk (10-20%) for women with multiple risk factors, markedly elevated levels of a single risk factor, metabolic syndrome, first degree relatives with early onset of CVD and subclinical CVD (e.g. coronary calcification) and low risk (<10%), mainly for women with 1 or no risk factors. Hypertriglyceridemia, low HDL cholesterol, diabetes and the metabolic syndrome are more potent risk factors for CHD in women compared with men. High-sensitivity C-reactive protein (CRP) and anemia are other novel risk factors for women and hypoestrogenemia of hypothalamic origin may be a risk factor for pre-menopausal women and one possible cause for the increased mortality in young women versus age-matched men in acute myocardial infarction (MI) as well as post bypass surgery. For prevention aspirin, β -blockers, angiotensin converting enzyme (ACE) inhibitors and statins are indicated for higher risk women, whereas for lower risk healthy life style changes are recommended.

Women may present with atypical symptoms; the exertional component is the most important gender-related difference in symptom predictive accuracy. In terms of diagnosis, the exercise stress test has lower sensitivity and specificity in women as compared to men (60-70% vs 80%), in part due to their lower CHD prevalence and their inability to achieve maximal workload. Symptomatic women with at least intermediate pretest risk, with a normal resting ECG and capable of maximal exercise should undergo exercise testing. Symptomatic women with at least intermediate pretest risk with abnormal resting ECG or maximal exercise capacity <5METS should be evaluated with SPECT imaging with pharmacological stress, with a mean sensitivity of 80%. Stress echocardiography is an alternative with equal sensitivity but higher specificity, with obesity and lung disease being the main limitations. Because of older age and higher risk profile, differences in symptoms and pain perception, lower predictive accuracy of the noninvasive tests and a slightly higher risk of adverse outcome following revascularization, women are referred to coronary angiography less often than men. However, once they are catheterized, they are treated similarly to men.

Women present more often with angina and less often with acute myocardial infarction (AMI) and in acute coronary syndromes (ACS) they present with unstable

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angina rather than non-ST elevation MI (NSTEMI). In addition, in ACS there is a differential expression of cardiac biomarkers; men have higher creatine kinase MB and troponins, whereas women have elevated CRP and brain natriuretic peptide (BNP). Sudden death in young women is associated with plaque erosion rather than plaque rupture that occurs in older women and all men. Women present more often with congestive heart failure although they have better left ventricular function compared to men and they are more symptomatic for any given extent of coronary disease. In addition, almost 50% of women, evaluated for suspected ischemia, do not have obstructive coronary artery disease; this may be associated with microvascular dysfunction and more diffuse disease.

In ACS, only high risk women benefit from the invasive approach, whereas in ST-elevation MI (STEMI) primary percutaneous coronary intervention (PCI) is the treatment of choice if available with door to balloon time <90 min. In cardiogenic shock the benefit from revascularization is similar to men. Women, because of age, comorbidities and smaller body surface area, have worse clinical outcome following elective PCI or coronary artery bypass grafting (CABG) surgery compared to men but this difference has been very much decreased over the years. Drug-eluting stents are equally effective in women as are minimal access approaches in cardiac surgery. Despite smaller vessels and higher incidence of diabetes, women have similar rates of target lesion revascularization (TLR) post-PCI. Vascular complications are 1.5-4 times more frequent in women.

SUGGESTED READING

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