References


Is the exercise test of use in post-menopausal women with unstable coronary artery disease?

See page 230 for the article to which this Editorial refers

The correct answer cannot be a simple ‘yes’ or ‘no’. The answer is a complex one. A first observation is that the exercise test has a very low predictive value for the presence of coronary artery disease in men as well as women in populations with a low incidence of coronary artery disease, for instance in pre-menopausal women or in men less than 40 years old [1]. Although the prevalence of coronary artery disease in women is lower than that in men, particularly in the pre-menopausal years, the prevalence of ST depression is higher in women younger than 45 years. This high prevalence of false-positive findings on exercise testing has been attributed to the presence of a higher oestrogen level. There is indeed good evidence that oestrogen may be a vasoconstrictor to coronary arterioles. It has a chemical structure similar to that of digitalis, which also has been demonstrated to be a vasoconstrictor. Men receiving large doses of oestrogen for carcinoma of the prostate may have increased degrees of ST depression. It is, moreover, well known that because women have a lower prevalence of coronary artery disease than men, there are likely to be a higher number of false-positive tests with, as a consequence, a higher number of coronary angiograms performed in women for the diagnosis of coronary artery disease after a positive exercise test.

This bias in many studies will reduce the specificity, thus supporting the concept of false-positive tests in women. The true cause of the increased false-positive rate of exercise tests in women is nevertheless still being debated. In patients with a well documented history of coronary artery disease, as in patients after myocardial infarction or with angina pectoris, stable or unstable, ST segment depressions during exercise test or Holter monitoring are highly predictive of myocardial ischaemia [2]. Several authors have found that women with coronary artery disease have a frequency of myocardial ischaemia similar to that of men.

A second point is that women with coronary artery disease are more likely to have atypical symptoms, including the absence of chest pain at exercise; pain in other locations, such as the jaw, arms, shoulder, back, and epigastrium; and angina-equivalents, such as dyspnoea, palpitations, and pre-syncope. A safe and accurate approach for the detection of coronary artery disease in women must be guided by clinical likelihood based on patient age, chest-pain quality, and risk factors, mainly diabetes and post-menopausal status without hormone replacement therapy. Although computerized exercise ST-segment analysis and a multivariable approach for the interpretation of exercise tests were used, several authors have demonstrated that stress echocardiography is more sensitive than exercise score, and more sensitive and specific than ST-segment analysis for the diagnosis of coronary artery disease in women [3].

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Is exercise test a good tool for risk stratification after an acute coronary event?

The prognostic value of exercise testing after an acute coronary event has been well documented. The purpose of the test is not only to evaluate prognosis, but to estimate functional capacity and haemodynamic responsiveness and to determine the presence of important exercise-provoked ventricular arrhythmias. Numerous reports have demonstrated that patients capable of completing a low-level exercise protocol (70–80% of age-predicted maximal heart rate), without exercise-induced abnormalities, have a low 1-year mortality rate (–2%).

The answer to the question of the value of the exercise test for risk stratification after an acute coronary event is nevertheless highly dependent on the interpretation of the results of the exercise test. Computerized analysis of the exercise electrocardiogram and the multivariate analysis, including maximal heart rate, maximal work load, less than 30 mmHg exercise-induced systolic blood pressure increase, rate-pressure product, evolution of R amplitude in lead C5, improve the prognostic value of the exercise test in men and women dramatically. From the data of a meta-analysis, after myocardial infarction, the inability to perform a low-level predischarge exercise test, the presence of an abnormal systolic blood pressure response, poor exercise capacity and exercise induced ST-segment depression in patients with inferior wall myocardial infarction were associated with an increased risk of subsequent coronary events. More recent studies have demonstrated that the use of a symptom-limited maximal exercise test increased the predictive power of an exercise test. In anterior wall myocardial infarction, exercise-induced ST-elevation in the Q wave leads is associated with poor left ventricular function and exercise-induced abnormalities, have a low 1-year mortality rate (–2%).

Several studies have thus demonstrated an interest in the multivariate analysis of the exercise test in different conditions: stable angina pectoris, early exercise test after an acute coronary event, unstable angina and myocardial infarction, and after thrombolysis. The study of Säfström et al. in this issue confirms this view in post-menopausal women in unstable coronary disease. All these considerations should not let us forget that pre- or post-menopausal women, with or without oestrogenic treatment, with atypical chest pain in the presence of risk factors for coronary artery disease, must be submitted, if a doubt persists about the diagnosis of coronary artery disease after the non-invasive investigations, to coronary angiography more quickly than men. When coronary artery disease is proved, especially after an acute coronary event, no gender difference has to be established for the interpretation of an exercise test.

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