Cardiovascular risk scales in women

Escalas de riesgo cardiovascular en la mujer

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INTRODUCTION

The estimation of cardiovascular risk (CVR) continues to be a significant challenge for preventing cardiovascular disease (CVD) in both men and women. Current guidelines on CVD prevention are based on individual evaluations applied to epidemiological risk tables. As Latin America lacks sufficient information to make its risk scales, it is necessary to extrapolate those derived from different studies in non-representative populations, constituting this a severe limitation.

Women have unique cardiovascular risk factors (CVRFs) and unrecognized CVRFs that significantly impact CVR. Therefore, determining their risk is complex.

In the American Heart Association (AHA) CVD prevention guidelines for women, an algorithm for risk classification is proposed, taking into account some exclusive CVRFs, and defining three categories: high risk, at risk, and optimal risk based on in the presence of documented CVD, traditional CVRFs, incorporating a history of pregnancy complications, the presence of autoimmune diseases, central obesity, and functional exercise capacity.[1] In 2011, the term «ideal cardiovascular health» was introduced, defined as the absence of clinical CVD and ideal concentrations or levels of total cholesterol (TC < 200 mg/dL), blood pressure (< 120/80 mmHg), and fasting blood glucose (< 100 mg/dL), plus a healthy lifestyle.[2] This strategy allows those who, in the conventional evaluation, would not qualify to receive preventive treatments to be re-categorized and benefit from early and intensive preventive interventions.

The Reynolds score was validated in a significant population of women. In addition, it showed great power to reclassify both men and women at higher or lower risk, adding the family history of acute myocardial infarction (AMI) and high-sensitivity c-reactive protein (CRP) to conventional CVRFs. However, it also did not include women-specific CVRFs.[3]

The risk calculator proposed by the ACC/AHA (ASCVD Risk Estimator) does not include data from the Latino population and cannot be applied to people that are not Caucasian or Afro-American.[4]

The European Systematic Coronary Risk Evaluation system (SCORE) recently introduced the SCORE2 and the SCORE OP (Older Persons). It involved data from around 700,000 participants without previous CVD between 1990 and 2009. They establish four European regions with various levels of risk, provide estimates of fatal and non-fatal CV events, and consider diabetes mellitus (DM), correcting shortcomings of the previous SCORE. This model adjusts the specific risk by gender, based on cohorts of 66% of women, and includes individuals older than 65 with the SCORE OP. Importantly, it takes non-HDL cholesterol instead of TC or HDL-C, which could better discriminate the long-term risk of CVD, especially in young individuals. However, the disadvantage is that it does not consider women's CVRFs.[5] The INTERHEART score, based mainly on the PURE study (Prospective Urban Rural Epidemiology), was validated in seven regions of the world, differentiating among low-, moderate-, and high-income countries, including a good number of Latino

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populations. In addition, it incorporates variables such as diet, exercise, depression, and stress, which are not considered in other scores.[6]

Finally, the WHO developed a risk prediction model for fatal and non-fatal events (AMI and stroke), adapted for low and middle-income countries, applicable to 79 countries in 21 regions. Latin America was divided into five regions: Caribbean, Central, Andean, Tropical, and South. It has gender-specific models, and it is currently recommended by the WHO for the Americas region.[7]

Age is the non-modifiable CVRF that most affects all risk calculators. For this reason, CVR is underestimated in young people, especially women, when the risk estimation is limited to 10 years, which is the usual period for most scores. The US National Health Survey, with a median age of 44, found that 82% of the surveyed people were at low risk at ten years. However, when extended to a lifetime risk estimate (LTR), almost two-thirds of this population was reclassified as high-risk.[8]

Women-specific CVRFs are present at young ages or in pre-menopause, where the calculated CVR is generally low. For example, a study in young women with a history of pre-eclampsia, who evaluated CVR at ten years, 30 years, and LTR, compared with healthy controls, found a high CVR at ten years in 18.2% in patients with pre-eclampsia vs 1.7% of controls, at 30 years 31.3 vs 5.1%, and the projected CVR LTR 41.4 vs 17.8%, respectively.[9] This is a clear example of the usefulness of using the LTR in young women with a history of specific CVRFs.

Algorithm for estimating cardiovascular risk in women *(Figure 1)*.[10] Women who have had CVD or those with evidence of atherosclerotic disease without a previous event should be treated with secondary prevention goals.
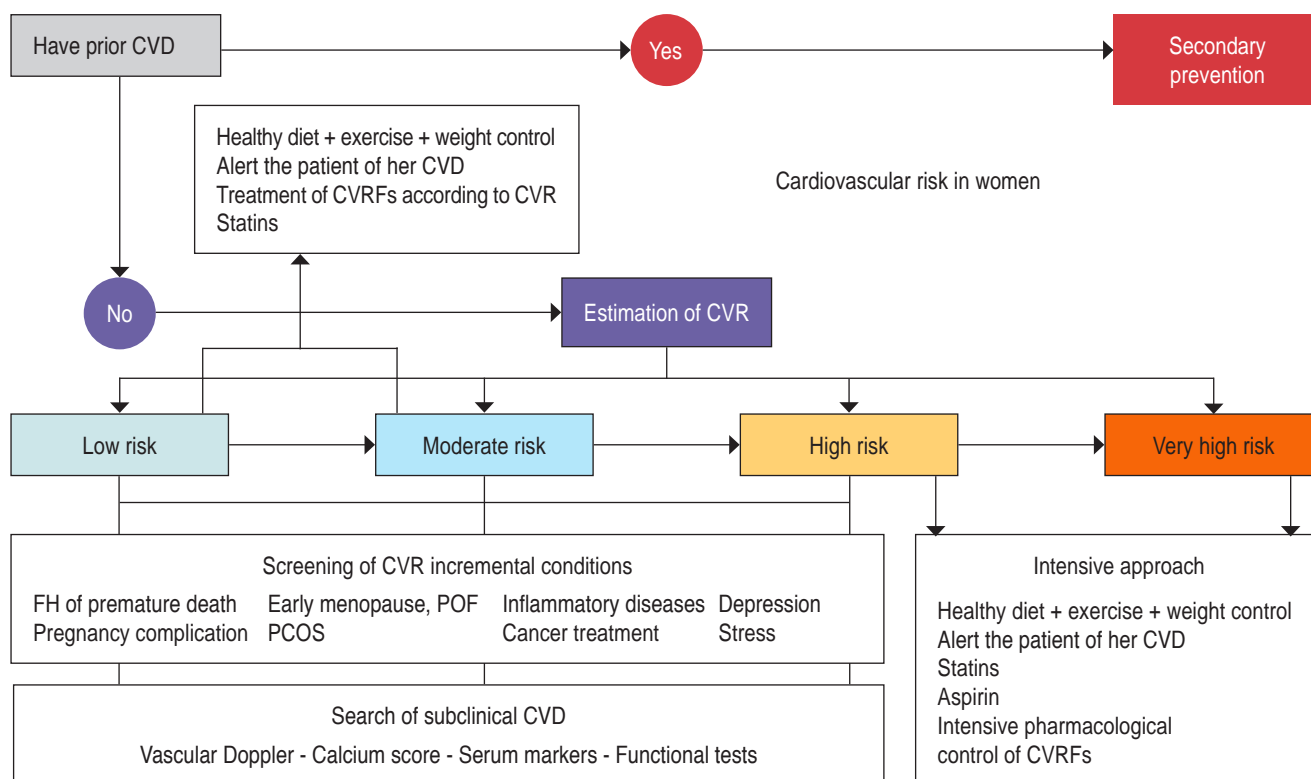

Figure 1: Algorithm for estimating cardiovascular risk in women.
CVD = cardiovascular disease. CVRFs = cardiovascular risk factors. CVR = cardiovascular risk. FH = family history. POF = premature ovarian failure. PCOS = polycystic ovary syndrome.

1. In those who have not had a previous CVD or without a diagnosis of atherosclerotic disease, the CVR should be calculated considering the traditional CVRFs. Those Latin American countries that have validated any of the above-mentioned risk estimations can use that score to determine CV risk. Those who do not have this validated tool can use the Interheart Risk Score or the Euroscore,[2] calibrated by the corresponding correction factor, or the WHO score according to their region.[5,7]

2. When presenting unique or emerging CVRF, a woman should be considered «at risk» and moved to the immediately higher risk group (intermediate, high, or very high). In its absence, it remains in the low-risk group or the one considered by the chosen calculator.

3. It is recommended to search for subclinical atheromatosis in those women at intermediate risk or with higher CVRF, with the methods available in the reference center.

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