Molecular signatures of cardiovascular disease risk: potential for test development and clinical application.

Most cardiovascular diseases are multifactorial by etiology. As an example, the development of myocardial infarction is promoted by numerous risk factors, ranging from rather modifiable lifestyle habits (e.g. smoking, physical activity) to genetic predisposition. With respect to the latter, 15 years of candidate gene analyses have failed to explain the molecular basis for the genetic predisposition to myocardial infarction. By contrast, recent genome-wide association studies have identified chromosomal loci that reproducibly displayed some association with myocardial infarction risk. When molecular genetic studies of coronary artery disease were first begun, it was assumed that genetic factors would soon be routinely incorporated into risk prediction scores. A number of biomarkers have been identified and tested in combination with the classical risk factors for refined risk prediction. However, the strategy for individualized risk prediction by incorporation of new biomarkers in established scores has so far proven to be more difficult than at first hoped.