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Contemporary biomarker moderately contribute for predicting future cardiac events

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Established cardiovascular risk factors include dyslipidemia, smoking, hypertension, and diabetes. In addition to the conventional risk factors, there are identified individual biomarkers related to cardiovascular risk. They include C - reactive protein (CRP), B-type natriuretic peptide (BNP), fibrinogen, D-dimer or homocysteine and may be used to identify people who are at risk for the development of aggressive cardiovascular disease and who could be targeted for preventive measures.

There have been a large number of epidemiological and observational studies that evaluate evidence of new cardiovascular risk markers. This study is believed to be the largest analysis to compare and combine several reported biomarkers in predicting death and major cardiovascular events in a large, community-based cohort.

In the current study, 10 biomarkers were measured in 3209 participants attending a routine examination cycle of the Framingham Heart Study: CRP, BNP, N-terminal proatrial natriuretic peptide, aldosterone, renin, fibrinogen, D-dimer, plasminogen-activator inhibitor type 1, homocysteine and the urinary albumin-to-creatinine ratio.

Two outcomes were assessed: death from any cause and major cardiovascular events (fatal and nonfatal myocardial infarction, heart failure and stroke).

During a median 7.4 years of follow-up, 207 participants died, and 169 had a first major cardiovascular event. After adjustment for conventional risk factors, 5 biomarkers most strongly predicted *risk for death* (BNP, CRP, the urinary albumin-to-creatinine ratio, homocysteine and renin level) and 2 biomarkers were found to predict *risk for cardiovascular events*, with BNP and the urinary albumin-to-creatinine ratio predicting both risks for death and risk for cardiovascular events. People with multimarker scores had a risk for death 4 times as great and a risk for major cardiovascular events almost 2 times as great as people with low multimarker scores ($P < 0.001$).

In conclusion, this analysis of data from the Framingham study has suggested that use of 10 common contemporary biomarkers added only moderately to the overall prediction risk based on conventional cardiovascular risk factors in healthy individuals.

Comment on the paper:

Wang TJ, Gona G, Larson MG et al – Multiple Biomarkers for the Prediction of First Major Cardiovascular Events and Death. *N Engl J Med* 2006; 355:2631-2639