Assessment of risk and reduction of risk are well-accepted responsibilities of the physician. The pathway from assessment of risk to reduction of risk basically involves three steps: (1) measurement of risk factors and collection of clinical data relevant to patient risk; (2) interpretation of risk-related data with estimation of risk in absolute terms (eg, risk of an event per year) as well as relative terms (ie, low, intermediate, or high compared with others of the same age and sex); and (3) on the basis of risk estimation results, intervention to minimize disease risk or to prevent risk factor development in the future. Although the process seems reasonably straightforward, problems occur at each step that weaken the link between risk assessment and risk reduction. Such problems occur in assessment of CVD risk estimation and reduction just as in most other areas of medical practice in spite of the availability of excellent data relating to CVD risk estimation from the Framingham Heart Study and other similar data sets.1

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Periodic measurement of CVD risk factors in healthy people (step 1) is routinely recommended by the AHA, the ACC, and the NHLBI, in addition to other authorities on disease prevention.2-4 Blood lipid measurements, blood pressure readings, age, sex, cigarette smoking and diabetic status, ECG findings, and other risk predictors can be recorded or measured in the office setting and can be entered into risk assessment algorithms.5 Unfortunately, studies show that physicians frequently fail to collect these simple and well-accepted data elements in the course of usual medical care.6 Even such basic clinical assessments as the blood cholesterol level, blood pressure, and cigarette smoking status are not routinely obtained,6 and lack of such data obviously impedes risk assessment.

Interpretation of risk factor data (step 2) also poses problems. Over the past three decades, cardiovascular risk profiles and risk instruments have been available from long-term observational studies.5 Such tools were expected to improve the ease and quality of risk-related medical decisions by making risk assessment more quantitative. Indeed, a 1976 Framingham Heart Study publication7 stated: "The 10 percent of persons identified with the use of this [risk assessment] function as at highest risk accounted for about one fifth of the 8 year incidence of coronary heart disease and about one third of the 8 year incidence of atherothrombotic brain infarction, hypertensive heart disease and intermittent claudication. Hence, the function provides an economic and efficient method of identifying persons at high cardiovascular risk who need preventive treatment and persons at low risk who need not be alarmed about one moderately elevated risk characteristic."

In this issue of Circulation, an updated version of the Framingham Risk Prediction Score and a new clinically usable instrument are published1 along with an extensive commentary from the AHA Task Force on Risk Reduction.8 The new Framingham Risk Score uses recently adopted clinical cut points from NCEP2 and from the JNC-VI.1 The commentary8 revisits the concept that risk scores such as those from Framingham should prove useful to healthcare professionals engaged in risk factor reductions for individual patients and might assist in selection of specific therapies.

The goal of targeting risk-reducing treatments to persons most likely to benefit is an appropriate one. Promotion of this goal was the focus of the ACC’s 27th Bethesda Conference: matching the intensity of risk factor management with the hazard for coronary disease events.7 An advanced risk prediction instrument was prepared as a part of that report, but there is little evidence that it has received attention outside of the conference. Despite the availability of risk estimation tools such as those developed over many years from Framingham, physicians cannot readily interpret the results (step 2 of the process). Risk scores can be based on coronary morbidity as well as mortality, and there is no general agreement which to use or whether to use a combination of the two. Newer risk factors, such as lipoprotein(a), homocysteine, LDL particle size, and thrombotic markers, are not included in the available risk equations. It is uncertain whether such new markers would improve risk assessment and treatment selection. Risk scores, including the Framingham Score, may or may not be accurate risk predictors in populations that differ from those in which the original data were collected, eg, lower-risk populations such as Asians or Latin Americans. Some risk assessment tools, including the Framingham Risk Score, find no increase in coronary heart disease risk for women with increasing age from 55 to 75 years, a finding that is not in accord with other epidemiological data sets.10,11 Thus, risk interpretation is also problematic.
The third step in risk reduction is intervention, and problems exist here as well. Survey data show that physicians frequently fail to achieve target levels for optimal risk reduction of hypercholesterolemic or hypertensive patients.12,13 Even when the risk factors have been measured properly, patients have been diagnosed appropriately, and interventions have been initiated, problems with patient compliance or lack of appropriate follow-up can lead to inadequate risk factor control. It is not surprising that multiple risk factors pose a particular challenge in clinical care when single risk factors are often not treated to target levels that are well accepted and widely disseminated, such as those of the NCEP and JNC-VI.

Because they are aware of the many problems on the pathway from risk assessment to risk reduction, the AHA, ACC, and NHLBI plan to undertake a review of available cardiovascular risk assessment methods to advise clinicians how to improve risk assessment and risk reduction processes in clinical practice. Data such as those from Framingham1 will be exceedingly important in informing the deliberations of these three policy-forming groups. At least three steps are necessary before any risk assessment tool can achieve widespread use: (1) development of a tool that incorporates all or most measures of risk that are already widely available; (2) validation of the usefulness of such a tool in clinical practice; and (3) discovery of ways to improve risk measurement and incorporate risk assessment more readily into a busy clinician’s daily routine. It is hoped that risk assessment tools such as the Framingham Risk Score can soon be made widely available, will be clinically confirmed as accurate, will be found by clinicians to be acceptable and convenient to use, and will ultimately improve the quality of patient care.

References


KEY WORDS: Editorials ■ risk factors ■ coronary disease

Selected Abbreviations and Acronyms

ACC = American College of Cardiology
AHA = American Heart Association
CVD = cardiovascular disease
JNC-VI = Joint National Committee on Hypertension Detection, Treatment, and Control
NCEP = National Cholesterol Education Program
NHLBI = National Heart, Lung, and Blood Institute
Problems on the Pathway From Risk Assessment to Risk Reduction
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