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Providing Patients with Global Cardiovascular Risk Information: Is Knowledge Power?

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Studies done by the World Health Organization (WHO) show that at least one third of all disease burden in developed countries can be attributable to five modifiable risk factors: tobacco, blood pressure, cholesterol, obesity and alcohol.¹ Patients play a fundamental role in public health as they ultimately make decisions regarding how to lead their lives. These important choices impact their health, the effectiveness of prescribed treatments, and their use of medical resources. Therefore, in order to improve the health of patients, the role of health care professionals extends beyond practicing evidence based medicine to providing patients with an easy-to-understand assessment of their cardiovascular disease (CVD) risk and the means to modify their risk.

Current guidelines recommend office-based risk stratification of all individuals using multiple risk factor scores to determine global risk. An expanding number of readily accessible assessments of global CVD risk have been widely available to practitioners for more than a decade. The 'gold standard' is the Framingham risk score² which uses age, total or low-density lipoprotein (LDL) cholesterol, high-density lipoprotein (HDL) cholesterol, smoking, blood pressure and history of diabetes mellitus to estimate sex-specific risk of coronary heart disease (CHD) events over the subsequent 10-years. Each individual's risk can then be categorized as low, intermediate, or high risk (<10%, 10 to 20%, and > 20%, respectively). Subsequent risk scores have built on the Framingham score, by making modifications in either the included risk factors and/or the predicted outcomes. For example, the National Cholesterol Education Program Adult Treatment Panel (ATP-III) guidelines³ recommend a modification that predicts 'hard' CHD events (only myocardial infarction and coronary death). The latest Framingham risk score uses the above predictors to calculate the 10-year-risk of 'all manifestation of CVD', including CHD, cerebrovascular disease, peripheral vascular disease and heart failure.⁴ Other risk prediction tools, such as the Reynolds Risk Score⁵, have incorporated the use of biomarkers and family history of premature CHD. Several tools that estimate global CVD risk have been developed in Europe, such as PROCAM⁶ and HEARTSCORE⁷, which are variations of the Framingham score.

Current guidelines recommend estimation of global CHD risk and matching the intensity of risk factor lowering with the probability of disease.⁸ Treatment for cholesterol lowering, for

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example, links lipid goals to global CHD risk.³ Solid evidence exists that modifying the variables that comprise global CHD risk assessment tools via smoking cessation, blood pressure management, physical activity, and selected use of medications leads to decreases in CHD.⁹ Nevertheless, and surprisingly, there is no clear evidence regarding whether providing patients with global CHD risk information actually improves risk perception, adherence to therapy and, ultimately, improvements in cardiovascular outcomes.

This important question was addressed by Sheridan and colleagues in this issue of *Archives*.¹⁰ The investigators performed a systemic review of relevant studies, spanning almost three decades, which included adults with no prior history of CVD who had their global risk presented to them. Measured outcomes of interest included risk perception, intent to start treatment, adherence to therapy, reduction in risk factors and global risk, and CVD event rates. Among the studies that they excluded were those focusing on the accuracy or validation of the risk score and physician response to the scores. Despite a varied use of risk calculators in these studies, nearly all individuals were in the moderate and high risk categories. They found evidence that knowledge of global risk improved accuracy of perceived risk and increased the intent to take medications, especially when concomitant counseling was provided. In particular, repeatedly providing patients with risk information and counseling had modest, but favorable, effects in 10-year predicted CHD risk, while providing patients with their measure of risk only once appeared to have no risk reduction benefit.

The authors appropriately point to the dearth of definitive studies on this subject and their difficulty in coming to a conclusion based on such heterogeneous data. There was suggestive evidence that informing people of their global CHD risk improves their risk perception and that repeated interventions may lead to small improvements in risk reduction, but whether this is clinically meaningful is unclear. They make the essential point that these findings are consistent with previous experiences in the realm of health risk appraisal tools: that risk information on its own is not effective and needs to be coupled with other tools to promote healthy behavior.

Similarly negligible effects of an 'information only' approach were recently reported in a study that looked at calorie labeling and food choices in New York City, where despite a large increase in peoples' awareness of food choices, there was no change in total purchased calories.¹¹ Direct-to-consumer genetic testing companies have long argued that providing people with genetic-risk information would inspire them to take more responsibility for their health and wellbeing. Nevertheless, the data thus far in this regard leads us, one again, to the conclusion that providing people with mere information related to risk of disease, especially if done at one point in time only, may not increase motivation to change behavior.¹² Moreover, the potential for deleterious changes in behavior resulting from being assured by a low-risk assessment was not addressed by the study of Sheridan and colleagues. This is an important topic for further investigation since less than 3% of asymptomatic adults, particularly among women, fall into the high risk group as defined by the Framingham score.

Studies that examine the effect of risk assessment on behavior changes and cardiovascular outcomes are quite timely, and should encourage more definitive research. The authors point out that data on the effects of risk assessments on adherence to medications, blood pressure reduction, smoking cessation, initiation of aspirin, diet, and exercise, all foundations for effective prevention of CHD, is quite anemic. In fact, a recent report by the Committee on Comparative Effectiveness Research Prioritization of the Institute of Medicine¹³ recommended, amongst their list of 100 priority topics for research, to "compare the

effectiveness of adding information about new biomarkers (including genetic information) with standard care in motivating behavior change and improving clinical outcomes.”

Nevertheless, even as further studies are needed to determine whether global risk scores result in behavior change or improved clinical outcomes, there is clinical utility in assessing global risk. Specifically, assessment of global risk is central to clinical decision making regarding initiation and maintenance of therapies and quality assessments when risks and benefits of interventions are in question. Measureable and reproducible scores allow for swift calculations of risk thresholds for selecting individuals above which certain interventions are deemed beneficial or cost-effective.

We need to shift from a reactive to a preventative paradigm in medicine. This would require greater patient involvement in decisions that affect their health status. The role of risk scores in this shift, and the newer biomarker and genetic information relating to personalized medicine remain to be determined. However, as this systematic review demonstrates, information alone is not an effective way to produce desired changes in health outcomes and much remains to be learned.

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