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EDITORIAL COMMENT

Cardiovascular Health, Simplified*

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The famous axiom attributed to Ben Franklin that "an ounce of prevention is worth a pound of cure" applies equally well to both fire safety and to heart health. Most cardiovascular disease (CVD) deaths are avoidable with healthy lifestyle, good preventive care, and targeted guideline-directed medical treatment. Epidemiological data show that major risk factors such as cigarette smoking, obesity, poor dietary habits, physical inactivity, dyslipidemia, diabetes, and hypertension account for the majority of CVD risk in both sexes across all regions of the globe (1).

Gómez-Pardo et al. (2) previously constructed the Fuster-BEWAT (blood pressure [B], exercise [E], weight [W], alimentation [A], and tobacco [T]) score (FBS) for lifestyle-based CVD prevention, which collects information on lifestyle and CVD risk factors including physical activity, diet, smoking, body weight, and blood pressure. In this issue of the *Journal*, Fernández-Alvira et al. (3) compare the effectiveness of the FBS with that of the ideal cardiovascular health score (ICHS, also known as "Life's Simple 7"), which includes several of the same CVD risk factors but importantly also includes laboratory measures of blood cholesterol and glucose.

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Using a cohort of 4,047 participants (ages 40 to 54 years) enrolled in the PESA (Progression of Early Subclinical Atherosclerosis) study, Fernández-Alvira et al. (3) categorized participants into poor, intermediate, or ideal CV health by using both scores. Only 3.7% of subjects met all ideal ICHS metrics, whereas 6.5% met all ideal FBS metrics. This disappointing representation of ideal cardiovascular (CV) health in the general population is consistent with prior large studies. In a similar study from our group, Ahmed et al. (4) analyzed an older cohort (ages 44 to 84 years) of 6,229 primary prevention participants in MESA (Multi-Ethnic Study of Atherosclerosis) and observed that only 2% of patients adopted all of the following: 1) exercise according to recommended guidelines; 2) eating healthy; 3) avoiding smoking; and 4) maintaining a normal weight. Clearly, much more work is still needed to improve lifestyle choices in the community.

Such efforts have significant potential to bear fruit. For example, in their analysis of PESA, Fernández-Alvira et al. (3) show that patients with ideal CV health, estimated both by ICHS and by FBS, had significantly lower adjusted odds of having the following: 1) atherosclerotic plaque (in the carotid arteries, aorta, or iliofemoral arteries); 2) any coronary artery calcium (CAC); and 3) advanced CAC score elevation. These findings are consistent with prior data. For example, Ahmed et al. (4) also scored participants on the basis of healthy lifestyle metrics (note their MESA score also excluded laboratory measures) and studied the association between healthy lifestyle and downstream outcomes. In MESA, participants with a higher MESA CV health score had a lower prevalence of any CAC in the study, a finding replicated by the authors of the present PESA study.

However, in MESA the investigators also had repeat CAC scores 3 years later, as well as long-term hard clinical outcomes. Ahmed et al. (4) found an association between these healthy lifestyle behaviors and reduced CAC progression 3 years later, as well as reduced CVD events and mortality over 7.6 years of follow-up. Furthermore, risk reduction was additive with the adoption of each 1 of these healthy behaviors. Participants with all 4 of these healthy behaviors had an approximately 80% lower death rate than did participants with no healthy behaviors. This study connected the

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protective effects of a healthy lifestyle across baseline subclinical vascular disease, atherosclerotic progression, clinical coronary heart disease, and death in a single longitudinal evaluation (4).

Although Fernández-Alvira et al. (3) could not yet assess long-term CVD outcomes in PESA, their study did show a relationship between a lifestyle score and multiterritorial atherosclerotic vascular disease in a large cohort of primary prevention participants. The discrimination of the FBS by C-statistics was identical to that of the ICHS with respect to the presence of plaque and CAC among PESA participants (c-statistic: 0.69 and 0.78, respectively) (3). More clinically intuitive results such as the sensitivity, specificity, and positive and negative predictive values for each of the FBS and the ICHS with the presence of subclinical atherosclerosis were not reported, nor were data on the calibration of these scores with extent of subclinical atherosclerosis.

Nonetheless, the results of Fernández-Alvira et al. (3) emphasize the important role of healthy behaviors on causal and actionable abnormal vascular findings that are upstream of the development of debilitating clinical disease. These investigators demonstrate that the FBS provides an alternative tool in settings where access to laboratory analysis is limited and clinical resources are constrained. The FBS also appears easier for clinicians to remember because it simplifies the more complicated physical activity and dietary components used in the ICHS. In resource-poor settings, it is promising to see that simple risk tools appear capable of doing the "heavy lifting" with regard to risk prediction and lifestyle modification. Although it is premature to conclude that the routine use of the FBS at health fairs and physicians' offices will result in reduced long-term CVD events, the fact that the FBS performed just as well as other more complex tools in predicting multiterritorial, subclinical disease is indeed very encouraging.

So, what is next for the FBS, ICHS, MESA, and other CV health scores? Further research is needed to confirm the utility of the FBS in long-term outcomes studies. However, investigating epidemiological associations represents the low-hanging fruit in this field of research. Can the FBS and other CV health scores be disseminated into clinical practice, and will physicians actually use them? Will patients modify their lifestyle on the basis of knowledge of their CV health score? Will such modification result in reduced CVD and improved CV wellness? These are harder research questions to tackle, but they are the ones most in need of answers if we want to alleviate the tremendous CVD burden that exists across the United States and around the globe.

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