JACC: Five health indicators are enough to predict cardiovascular risk in healthy people

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The Fuster-BEWAT score evaluates five health indicators: blood pressure, physical activity, body-mass index (BMI), fruit and vegetable intake, and smoking status

Just five indicators of cardiovascular health—blood pressure, physical activity, body-mass index (BMI), fruit and vegetable intake, and smoking status—accurately predict cardiovascular risk in healthy individuals. This is the conclusion of a study carried out at the *Centro Nacional de Investigaciones Cardiovasculares Carlos III* (CNIC) and published today in *The Journal of American College of Cardiology* (JACC). The study demonstrates that the Fuster-BEWAT score, which is based on these five cardiovascular health indicators, effectively predicts the presence and extent of subclinical (asymptomatic) atherosclerosis in healthy middle-aged individuals with no known history of cardiovascular disease. Moreover, **Fuster-BEWAT predictions are as accurate as those obtained with the widely used Ideal Cardiovascular Health Index (ICHS)**, the score currently recommended by the American Heart Association, which additionally includes blood analysis cholesterol and glucose.

The Fuster-BEWAT score was devised by a Spanish research team led by CNIC General Director Dr. Valentín Fuster, and the new study forms part of the **Progression and Early Detection of Atherosclerosis project** (PESA), a CNIC initiative conducted in partnership with Banco Santander. The results demonstrate the usefulness of the Fuster-BEWAT score for evaluating cardiovascular risk

in situations where it is not possible to obtain blood samples, because, unlike the ICHS, the Fuster-BEWAT score does not include blood analysis.

Previous studies had already indicated that blood analysis can sometimes be omitted from cardiovascular risk calculations, a particular advantage in regions with limited healthcare resources like the PURE study, coordinated by Salim Yusuf and recently published in *The Lancet*.

PESA-CNIC-Santander

PESA-CNIC-Santander is a prospective cohort study led by Dr. Fuster. In PESA, more than 4000 middle-aged office workers are monitored with the latest imaging technologies in order to characterize the prevalence and progression of subclinical atherosclerotic lesions. These imaging findings are scrutinized for associations with molecular markers and environmental factors, including those related to lifestyle, such as dietary habits, physical activity, psychosocial characteristics, and sleep patterns. The results of the *JACC* study show that a healthier cardiovascular profile on the ICHS or the Fuster-BEWAT score is linked to a lower prevalence and extent of subclinical disease in healthy individuals, demonstrating the impact of lifestyle and risk factors in the early stages of atherosclerosis. The results were obtained by using ultrasound and computed tomography to evaluate distinct vascular territories for the presence of subclinical disease (atheroma plaques in the carotid and iliofemoral arteries and abdominal aorta and calcification in the coronary arteries).

The ICHS and the Fuster-BEWAT score accurately predict the presence of atheromas, the amount of calcium in the coronary arteries (an early sign of coronary disease), and the number of arterial territories affected

The team found that both the ICHS and the Fuster-BEWAT score accurately predict the presence of atheromas, the amount of calcium in the coronary arteries (an early sign of coronary disease), and the number of arterial territories affected. CNIC researcher Juan Miguel Fernández-Alvira explains that both scores “use the same five cardiovascular health indicators: blood pressure, physical activity, a measure of dietary health, BMI, and tobacco smoking; the difference between them is that the ICHS also includes blood analysis of cholesterol and glucose.”

Dr. Hector Bueno, of the i+12 Research Institute (12 de Octubre University Hospital, Madrid) and an investigator on the study, believes that the equivalent performance of the two scores “could make the Fuster-BEWAT score a more practical and cost-effective option for promoting cardiovascular health, especially in regions with limited economic resources, in which the burden of cardiovascular disease is growing at an alarming rate.” This view is echoed by CNIC investigator Dr. Antonio Fernández Ortiz: “The Fuster-BEWAT score’s simplicity will facilitate its educational use outside the healthcare sector, for example in schools and universities, providing a tool for demonstrating the benefits of self-directed lifestyle changes to at-risk individuals as well as patients.”

For his part, Dr. Fuster is keen to highlight the invaluable contribution of the Santander-CNIC partnership, which provides a model for other research and business organizations to follow: “The PESA study makes an incalculable contribution to scientific knowledge and public health.” Echoing these sentiments, Banco Santander Medical Services Director Dr. José María Mendiguren, also an author on the study, adds that that the PESA study “positions Grupo Santander at the forefront of corporate social responsibility through its contribution to knowledge generation in the important field of cardiovascular health.”

Fernandez-Alvira, J. M., Fuster, V., Pocock, S., Sanz, J., Fernandez-Friera, L., Laclaustra, M.,...Bueno, H. (2017). Predicting Subclinical Atherosclerosis in Low-Risk Individuals Ideal Cardiovascular Health Score and Fuster-BEWAT Score. Journal of the American College of Cardiology, 70(20), 2463-2473. doi: 10.1016/j.jacc.2017.09.032

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