EDITORIAL

May Pulse Wave Velocity Improve Cardiovascular Risk Prediction in Individuals?

Se puede mejorar la predicción del riesgo cardiovascular a través de la velocidad de la onda de pulso?

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Pulse wave velocity (PWV) measurement along the aorta and more distal large arteries has been recognized for more than one century as an indicator of arterial stiffness, associated to the sclerosis of their walls in diverse pathological conditions such as hypertension and diabetes. (1) More recently, population studies have shown that PWV may predict the risk of future cardiovascular events in asymptomatic adults. (2, 3) However it remains uncertain whether PWV has the capacity to provide incremental information on cardiovascular risk prediction beyond traditional risk factors in asymptomatic adults without a clinical history of cardiovascular disease. This uncertainty on cardiovascular risk prediction by PWV probably explains that current guidelines are not unanimous in recommending its use to reclassify cardiovascular risk of individual patients and target preventive interventions. Some guidelines consider that increased carotid to femoral PWV above 12 m/s may upgrade the global risk score, which uses multiple traditional cardiovascular risk factors, to a higher risk category. (4) In contrast other guidelines consider that the measure of arterial stiffness outside of research settings is not recommended for cardiovascular risk assessment in asymptomatic adults. (5) Questions about the prognostic performance of PWV also arise from its strong dependence on age and blood pressure, an aspect well illustrated in the study by Christen et al. in this issue of the Journal (6) As age and pressure have a huge weight on the traditional multifactorial risk score assessment, they may confound PWV prediction. (7) The pressure dependence of PWV is primarily a specific physiological process that reflects the arterial stiffening produced by the tangential tension of the arterial wall induced by blood pressure. (7) This mechanical passive phenomenon should lead to the interpretation of PWV after correction for the pressure effect. (7) By contrast, age influence on PWV is a non-specific phenomenon that is observed with other arterial markers such as coronary artery calcium or carotid intima-media thickness. (8, 9) The strong relationships of age with these arterial biomarkers have led some investigators to use them for calculating arterial age. Arterial age is defined as the age corresponding to the 50th percentile of coronary artery calcium or carotid intima-media thickness in the general population. (10, 11) By substituting chronological age by arterial age in cardiovascular risk scoring by traditional risk factors, it is possible to estimate the increase or decrease of risk induced by a given value of the arterial marker, comparatively with risk calculated as usually with chronological age. The study by Christen et al. (6) should encourage such approach for PWV, as it would allow better interpretation of its influence on cardiovascular risk estimation in asymptomatic individuals..

Conflicts of interest
None declared
(See author's conflicts of interest forms in the web / Supplementary Material).

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Rev Argent Cardiol 2015;83:101-102. http://dx.doi.org/10.7775.rac.v83.i2.5845
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