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Early Vascular Aging (EVA) and lifestyle-based modulators (ADAM) of the vascular aging trajectory throughout life – preliminary results of a community-based registry

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In recent years, great emphasis has been placed on the role of arterial stiffness (AS) and central blood pressure (cBP) as measures of the cumulative effect of cardiovascular risk factors over the process of physiologic ageing. These parameters, currently labeled as arterial "tissue biomarkers", were shown to be independent predictors for the development of cardiovascular (CV) diseases, and could thus increase the discriminative capacity when coupled to classic CV risk scores. Consequently, the assessment of AS and cBP are recommended as additional tests for the clinical evaluation of hypertensive patients (based on history, physical examination and findings from routine laboratory tests), for estimating the global cardiovascular risk in the overall population, and for describing the vascular ageing continuum. Currently, the most widely employed methods for evaluating pulse waveforms are those based on applanation tonometry and transfer functions, although oscillometric blood pressure devices using specific algorithms for pulse wave analyses (PWA) have been proposed. At present, oscillometry is an affordable and reliable technique, and may allow a comfortable, accurate, repeated and prolonged estimation of arterial stiffness and central hemodynamics in daily life conditions, making it particular suitable for community-based follow-up intervention programmes, and for addressing the major questions underlined by the early vascular ageing (EVA) concept, namely: the validation of tissue biomarkers as surrogate end points for CV risk reduction; the determination of the predictive value of various of these arterial tissue biomarkers, and the discriminative improvement over conventional cardiovascular risk factors; the identification of effective and multidisciplinary actions to counteract the pathophysiological processes reflected in the EVA syndrome, particularly the aggressive decrease of atherosclerosis modifiers (ADAM). Hence, we designed a project to be implemented in a community setting based on the inter-play between Pharmacy Services, a Technology Company and a Research center, and the preliminary results will be presented.

Recent Publications

1. Picone D S, Schultz M G, Otahal P et al (2017) Accuracy of Cuff-Measured Blood Pressure: Systematic Reviews and Meta-Analyses. J Am Coll Cardiol. 70(5):572-586.

2. Teixeira R, Monteiro R, Baptista R, Pereira T, Ribeiro M A, Gonçalves A, Cardim N and Gonçalves L (2017) Aortic arch mechanics measured with two dimensional speckle tracking echocardiography. J Hypertens 35(7):1402-1410.

3. Omboni S, Posokhov I N, Parati G et al (2016) Vascular health assessment of the hypertensive patients (VASOTENS) registry: Study protocol of an international, web-based telemonitoring registry for ambulatory blood pressure and arterial stiffness. JMIR Res Protoc. 29;5(2):e137.

4. Pereira T, Pereira T S, Santos H, Correia C and Cardoso J.(2015) Arterial pulse pressure waveform monitoring by novel optical probe. Int J Cardiol. 179:95-6.

5. Pereira T, Santos I, Oliveira T, Vaz P, Pereira T, Santos H, Pereira H, Correia C and Cardoso J (2014) Pulse pressure waveform estimation using distension profiling with contactless optical probe. Med Eng Phys. 36(11):1515-20.

Biography

Telmo Pereira is a Senior Lecturer and Researcher at the Polytechnic Institute of Coimbra, Coimbra Health School. He is the Head of the Clinical Physiology Department. In the last five year, he has developed research in the areas of Cardiovascular Prevention and Neurosciences, and has collaborated in the development of new non-invasive technology options for the assessment of vascular function.

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