Endothelial function of healthy adults from 20 to 91 years of age: prediction of cardiovascular risk by vasoactive range

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Author(s) Königstein, Karsten; Wagner, Jonathan; Frei, Mirijam; Knaier, Raphael; Klenk, Christopher; Carrard, Justin; Schwarz, Achim; Hinrichs, Timo; Schmidt-Trucksäss, Arno
Author(s) at UniBasel Hinrichs, Timo ; Wagner, Jonathan ; Carrard, Justin ; Knaier, Raphael ;
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Brachial arterial low flow-mediated constriction (L-FMC) and flow-mediated dilation (FMD) are ultrasound-based biomarkers that emerge into scientific and clinical practice indicating cardiovascular effects of medical and lifestyle-based treatment beyond classical risk factors. This study is the first to provide reference values and to assess the predictive value of L-FMC, FMD and their composite endpoint vasoactive range (VAR) in healthy adults.; L-FMC, FMD and VAR were measured in 457 nonsmoking adults of 20-91 years without chronic diseases, medication, with normal heart function and very low cardiovascular risk. Sex-specific percentiles were calculated and predictive ability for elevated cardiovascular risk was assessed using receiver-operating characteristic (ROC) curves.; From 20 to 91 years of age, L-FMC increased 86.1 and 105.3%, FMD decreased 63.6 and 47.1% and VAR decreased 58.3 and 55.2% in women and men, respectively. Area under the ROC curves was 0.54 (95% CI = 0.49-0.54) for L-FMC, 0.67 (95% CI = 0.62-0.67) for FMD and 0.72 (95% CI = 0.67-0.72) for VAR ($P < 0.001$). Discriminatory cut-offs for elevated risk were 0.24% for L-FMC (sensitivity = 0.42, specificity = 0.67), 6.4% for FMD (sensitivity = 0.71, specificity = 0.60) and 6.3% for VAR (sensitivity = 0.62, specificity = 0.73).; This study demonstrates reduced endothelial function with aging in healthy men and women with very low cardiovascular risk. Percentiles crossed cut-offs for elevated cardiovascular risk between 50 and 55 years in men and 70 and 75 years in women, indicating higher risk for cardiovascular disease in men. VAR showed the highest ability to identify individuals with elevated cardiovascular risk, and should be included in the monitoring and treatment of accelerated vascular aging even in healthy individuals.
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