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The Association of Brachial Artery Flow-Mediated Vasodilation and Long-Term Cardiovascular Events in Subjects without Heart Disease

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Background:
Endothelial dysfunction is considered an important prognostic factor in atherosclerosis.

Methods and Results:
To find out the long-term association of brachial artery flow-mediated dilation (FMD) and long-term adverse cardiovascular (CV) events, we prospectively assessed brachial artery FMD, using high-resolution linear array ultrasound, in 618 consecutive healthy subjects without heart disease: 387 (63%) men, mean age 54±11 years and body mass index 28±4 kg/m^2. Subjects were divided into 2 groups: ≤ (n=309) and > (n=309) the median FMD of 11.3%. The 2 groups were comparable in regard to traditional cardiovascular risk factors, lipoproteins, fasting glucose, high-sensitivity C-reactive protein, concomitant medications and Framingham 10-year risk score. In a mean clinical follow-up of 4.6±1.8 years the composite CV events (all-cause mortality, non-fatal myocardial infarction, hospitalization for heart failure or angina pectoris, stroke, coronary artery bypass grafting and percutaneus coronary interventions) were significantly more common in subjects with FMD ≤ rather than > the median of 11.3% (14.2% vs 1.0%, p=0.0001). Univariate analysis demonstrated that the median FMD significantly predicted CV events [odds ratio (OR) 2.78, 95% CI 1.35 to 5.71, p=0.003]. Multivariate analysis controlling for traditional CV risk factors demonstrated that median FMD was the best independent predictor of long-term CV events (OR 2.93, 95% CI 1.28 to 6.68, p=0.011) (Figure).

Conclusion:
Brachial artery median FMD independently predicts long-term adverse CV events in healthy subjects with no apparent heart disease in addition to those derived from traditional risk factor assessment.