

Non-invasive assessment of endothelial function to identify cardiovascular risk in asymptomatic early menopausal women: what to do when Framingham fails?

V.M. Miller¹, T. Behrenbeck¹, S. Mulvagh¹, B. Lahr¹, T. Zais¹

¹Mayo Clinic, Rochester, MN, USA

Objective: Abnormal peripheral flow-mediated reactive hyperemia (PRH) is a surrogate for endothelial dysfunction and an indicator of premature atherosclerosis. This study tested the hypothesis that endothelial dysfunction is associated with atherosclerosis in early menopausal women, deemed low risk by conventional risk assessment.

Methods: A subset of women enrolled in the Kronos Early Estrogen Prevention Study (KEEPS), a clinical trial to determine impact of hormone therapy on progression of cardiovascular disease in early (<3 year) menopause, was evaluated prior to randomization to treatment for conventional risk factors as well as CIMT by ultrasound, CAC by 64 slice CT scanner, and PRH by ENDOPAT[®]

Results: One hundred and three women participated. All were Caucasian and none were diabetic. At enrollment, fourteen women had positive CAC scores [range 0.6-32 Agatston Units (AU)] and two women had CIMT lesions >40%. There were no differences in conventional risk factor profiles as calculated by the Framingham Risk Score (FRS)^a between women with vascular lesions compared to those without. PRH was inconclusive or abnormal in 40%. Women with inconclusive or abnormal PRH could not be distinguished using FRS (see Table; data presented as mean±SEM). PRH was abnormal in three women with positive CAC scores ranging from 1.3-31.6 AU, but normal in ten women whose CAC scores ranged from 0.5-106 AU.

Conclusions: Conventional risk factor assessment by FRS alone did not predict presence of premature atherosclerosis in this cohort of early menopausal women. Noninvasive assessment by PRH, CIMT, and CAC may be of synergistic and incremental value in this patient population.

	n	Smoking status	BMI (Kg/m ²)	Total Cholesterol (mg/dL)	HDL (mg/dL)	Tri-glycerides (mg/dL)	Mean Systolic BP (mmHg)	FRS ^a
Total group	103	Current 4 Past 25 Never 73	27.2±4.3	219.1±32.6	61.1±15.3	95.9±47.4	122.7±13.9	1.3±0.5
Negative tests (CIMT,CAC or PRH all negative)	51	Current 2 Past 13 Never 36	26.7±4.0	219.7±30.2	62.7±15.3	96.5±48.9	121.73±13.5	1.2±0.5
Inconclusive PRH (1.71-2.1)	24	Current 1 Past 4 Never 19	27.4±4.3	223.6±33.7	59.9±10.7	86.6±32.0	122.7±14.7	1.2±0.4
Positive tests (one or more CIMT, CAC, PRH)	28	Current 1 Past 9 Never 18	28.0±4.8	214.1±36.1	57.9±15.0	103.0±55.2	124.5±14.3	1.4±0.7

^aNCEP calculator

