Background: Perimenopausal age in women is associated with an increase in CV risk. The risk factors associated with development of atherosclerosis during this hormonal change are not clear.

Methods: Participants were those from ATHENA-CT, a sub-study of the PACC project, and included 117 asymptomatic perimenopausal women who had initial screening cardiac CT scans with a coronary artery calcium score (CCS) of zero. Standard CV risk factors were measured and hormone levels were obtained. These patients had repeat Cardiac CT Angiography 5-10 years later for assessment of non-calcified coronary artery plaque as well as development of coronary artery calcium (CAC). The risk factor, hormonal, and imaging characteristics of conversion from a zero to a non-zero CCS were assessed.

Results: Among perimenopausal women (mean age 50, average FRS 4.7) 18 showed conversion from a non-zero CCS. CCS conversion was significantly associated with the presence and extent of noncalcified coronary arterial plaque. Women with conversion had a mean of 2.89 [± 1.23] noncalcified plaques, versus 0.19 [± .40]; P< 0.001. Standard cardiovascular risk factors (lipids, blood pressure, diabetes, age), perimenopausal status, other atherosclerosis imaging variables (carotid intima media thickness, thoracic aortic atherosclerosis) and androgen hormones (SHBG, free testosterone) were not significantly different between groups. A family history of premature CHD in first and second-degree relatives tended to be more prevalent among women with CCS conversion.

Conclusions: Conversion from a zero to a non-zero CCS was observed during the perimenopausal period and was most closely associated with the presence of subclinical noncalcified coronary arterial atherosclerosis.