

High androgen levels in postmenopausal women and the risk for atherosclerosis and cardiovascular disease: the Rotterdam Study

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Context: Polycystic ovary syndrome (PCOS) is closely linked to hyperandrogenism. In PCOS, hyperandrogenism has been associated with metabolic disturbances which increase the risk for cardiovascular disease (CVD).

Objective: To assess the association between the possible postmenopausal remnant of polycystic ovary syndrome; i.e. high androgen levels, with prevalent atherosclerosis and incident CVD.

Methods: This study was embedded within the Rotterdam Study, a prospective population-based cohort study. Participants were assessed every 3-5 years. We used linear, logistic, and Cox proportional hazards models to assess the association of top quartiles (P75) of serum Testosterone, dehydroepiandrosterone (DHEA), androstenedione, SHBG and the free androgen index (FAI) with atherosclerosis and incident CVD.

Patients Women aged over 55. In total, 3,452 women were eligible for inclusion in this study. Women for whom informed consent and follow-up data was not available, who were not post-menopausal or entered menopause by a surgical intervention or at an unnatural age (age of menopause <40 or >62) were excluded. Leaving 2,578 women for our analysis.

Intervention: None

Main outcomes measures: Coronary artery calcium score, carotid intima media thickness, pulse wave velocity, peripheral artery disease and incidence of coronary heart disease, stroke, and cardiovascular disease.

Results: Mean age (standard deviation) was 70.19 (8.71) years and average time since menopause 19.85 (9.94) years. An FAI in the highest quartile was associated with higher pulse wave velocity [? (95%CI): 0.009 (0.000;0.018)]. Highest quartile DHEA [? (95%CI): -0.008 (-0.015;-0.001)] and androstenedione [? (95%CI): -0.010 (-0.017;-0.003)] levels were associated with a lower intima media thickness. During median follow-up of 11.36 years, 165 coronary heart disease, 215 stroke, and 359 cardiovascular disease events occurred. We found no association between high androgen levels and incident stroke, coronary heart disease, or cardiovascular disease.

Conclusions: Postmenopausal high androgen levels were not associated with an increased risk for CVD. Cardiovascular health in women with polycystic ovary syndrome might be better than was earlier anticipated.

