FACTORS ASSOCIATED WITH DEVELOPMENT OF PROLONGED QRS DURATION OVER 20 YEARS IN HEALTHY YOUNG ADULTS: THE CORONARY ARTERY RISK DEVELOPMENT IN YOUNG ADULTS (CARDIA) STUDY

ACC Poster Contributions
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Background: Prolonged QRS duration (QRSd) has been associated with adverse cardiovascular outcomes in middle-aged and older adults. Factors associated with the development of prolonged QRSd from young adulthood to middle-age have not been well described.

Methods: We analyzed 12-lead electrocardiograms (ECGs) in the NHLBI-funded CARDIA study for presence of prolonged QRSd, defined as QRSd>100 msec, over a 20 year period. We performed logistic (outcome: incident QRSd>100 msec at Year 20) and linear regression (outcome: continuous QRSd at Year 20) to examine associations with baseline (Year 0) traditional risk factors (RFs) and average RFs over time (from Year 0, Year 20 and at least one interval exam cycle). We also adjusted for baseline QRSd, ECG left ventricular mass index (ECG-LVMI), subclinical atherosclerosis, and echocardiogram measures.

Results: After excluding those with baseline prolonged QRSd (n=28), there were 1,910 participants (58% women, 42% black, mean age 25.3 years at baseline) with ECGs at Year 0 and 20 for the analysis; 212 (11.1%) developed incident QRSd>100 msec. In univariate analyses, Year 0 covariates associated with incident QRSd >100 at Year 20 included white race (OR 1.78, 95% CI: 1.25-2.53) and ECG-LVMI at Y0 (OR 1.10 per 1 g/m2.7, 95% CI: 1.05-1.14). Female sex had an inverse association (OR 0.28, 95% CI: 0.18-0.44). Further adjustment for subclinical atherosclerosis measures at Year 20 (coronary artery calcium and carotid IMT), Year 5 echo LV size (LV diastolic and posterior wall dimensions), and Year 0 QRSd attenuated the sex association, but white race (OR 1.63, 95% CI: 1.11-2.40) and ECG-LVMI at Year 0 (OR 1.13 per 1 g/m2.7, 95% CI: 1.08-1.18) remained significantly associated. A similar pattern of results was noted with continuous QRSd as the outcome, and using average values of RFs over time as covariates.

Conclusion: In younger adults, white race, ECG-LVMI at Year 0 and echo measures of LV size early in young adulthood appear to be strongly associated with incident QRS >100 msec over 20 years. Recognition of factors that contribute to development of prolonged QRSd may allow for interventions to reduce cardiovascular risk associated with this ECG phenotype in middle age.