LEFT VENTRICULAR THICKNESS AND ELECTROCARDIOGRAPHIC VOLTAGE CRITERIA IN A MULTI-ETHNIC POPULATION OF YOUNG ATHLETES: RESULTS FROM THE TEXAS ADOLESCENT ATHLETE HEART SCREENING REGISTRY (TAAHSR)

Poster Contributions
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Introduction: Established ECG-derived criteria for determination of true left ventricular hypertrophy (LVH) are often inaccurate. The degree to which ECG voltage criteria can precisely predict measured LV septal and posterior wall (PW) thickness by echocardiography (ECHO) remains to be fully determined in a multiethnic population. We sought to assess the association between ECG voltage criteria and measured LV thickness in a group of adolescent athletes participating in the Texas Adolescent Athlete Heart Screening Registry (TAAHSR) project, a community-based cardiovascular screening program for sudden cardiac death-related conditions.

Methods: A total of 1,450 adolescents aged 14-18 years (69% male) were screened between May 2010 and July 2011. Demographic data, 12-lead ECG and limited 2D-ECHO were obtained. ECG voltages (R in V6, S in V1, R+S in V3 & V4) were measured by hand and LV thickness was measured by M-mode in the parasternal short-axis view. Pearson correlation coefficients and prevalence odds ratios (OR) were used to assess the degree of association between ECG voltage criteria and LV thickness.

Results: Weak and non-significant linear correlations between ECG voltage criteria and LV thickness were observed in these data, either overall or stratified at the distributional median (p>0.05). For septal and PW thickness, no significant increased odds of being in the 98th percentile was seen for R in V6, S in V1, R+S in V3 & V4 (p>0.05). A significant association was observed between LV thickness and R+S in V4 for both septal (OR=3.07, 95% CI 1.22-7.73) and PW (OR =2.95, 95% CI 1.09-7.93) thickness.

Conclusions: ECG-derived voltage criteria for LVH obtained in a cardiac screening setting are not associated with LV thickness by M-mode derived measures on ECHO. Our data suggest that absence of LVH on ECG might not rule out true increased LV septal and PW thickness.