INCREASE IN CARDIAC MASS IS ASSOCIATED WITH ARRHYTHMIC SUDDEN DEATH RISK IN THOSE WITHOUT CAD

Poster Contributions
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Background: Left ventricular hypertrophy assessed noninvasively is associated with risk of sudden cardiac death (SCD) and ventricular arrhythmias. However, direct assessment of cardiac mass on autopsy has been never been evaluated as a predictor of arrhythmic sudden death (SD).

Methods: In the first 8 months of the Comprehensive UCSF SCD Study (02/2011-11/2011), results from systematic autopsy performed on 197 of 204 (96.6%) of all incident WHO SCDs citywide and 40 randomly selected accidental traumatic deaths (controls) were compared. Hearts were excised and weighed. The major epicardial arteries and their main branches were cut transversely at 2-mm intervals and decalcified before sectioning. Significant coronary artery disease (CAD) was defined as active coronary lesion or ≥ 75% cross-sectional area reduction in ≥1 coronary artery. Arrhythmic SDs required documented VT/VF and/or absence of fatal non-cardiac (eg, PE, lethal toxicology) or non-arrhythmic (eg, tamponade) autopsy findings.

Results: We compared data for the first 108 WHO SCDs, 64 adjudicated as arrhythmic and 44 nonarrhythmic cause. Mean cardiac mass index (CMI in g*m^2/kg) was higher in arrhythmic SDs than in trauma controls, 18.9 (95% CI 17.7-20.0) vs. 15.2 (95% CI 14.1-16.4), p<0.005. However, this difference varied by presence of significant CAD: for subjects without significant CAD, mean CMI was significantly higher in arrhythmic SDs than trauma controls (18.0 vs. 14.9), but was similar between arrhythmic SDs and controls with significant CAD (19.7 vs. 19.7). After adjustment for age, sex, and race, CMI was associated with arrhythmic SD in patients without significant CAD: OR 1.42 per 1.0 g*m^2/kg, 95% CI 1.14 - 1.75, p = 0.001) but not in those with significant CAD (OR 0.96, 95% CI 0.71-1.28, p=0.77; p=0.04 for interaction with CAD).

Conclusions: Mean CMI was similar in arrhythmic SDs and controls with significant CAD, but substantially higher in arrhythmic SDs than controls without significant CAD by 3.1 g*m^2/kg. The odds of arrhythmic SD increased 42% for every 1.0 g*m^2/kg increase in CMI among those without significant CAD. CMI may be a useful predictor of arrhythmic SD risk for those without significant CAD.