

Mitral valve dysfunction among sudden death victims

Gupta S.¹; Keen S.²; Thota S.³; Jiang H.⁴; Jones H.¹; Laible S.¹; Sauter C.¹; Lin FC.⁴; Simpson Jr RJ.⁵

¹The University of North Carolina at Chapel Hill., Chapel Hill, United States of America

²University of North Carolina, Department of Family Medicine, Chapel Hill, United States of America

³Appalachian Regional Healthcare, Hazard, United States of America

⁴University of North Carolina, Department of Biostatistics, Chapel Hill, United States of America

⁵University of North Carolina, Division of Cardiology, Chapel Hill, United States of America

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Introduction: Mitral dysfunction is a commonly found valvular abnormality in the US. The association between mitral dysfunction with sudden death is both complex and controversial.

Purpose: To assess mitral dysfunction as a potential risk factor for sudden death using medical and autopsy records in a population-based registry of sudden deaths.

Methods: From 2013-2015, out-of-hospital deaths aged 18-64 reported by Emergency Medical Services in Wake County, North Carolina were screened to adjudicate 399 sudden death victims. Medical records were available in 270 victims, echocardiograms in 53, and autopsies in 64. Echocardiogram reports of none/trace/trivial mitral insufficiency were compared to patients with mild, moderate, or severe insufficiency. Autopsy reports for thickened mitral leaflets, calcification, and redundancy were reviewed. Additionally, available echocardiograms from a control group of 1101 patients were reviewed for mitral insufficiency. Demographics and clinical comorbidities were assessed from medical and death records. Mean, t-tests, and a bivariate logistic regression were estimated, as appropriate.

Results: Of the 53 victims with echocardiograms, mean age was 53 years, 36 (65.5%) were male, and 21 (39.6%) were African-American. Victims with available echocardiograms were more likely to have congestive heart failure (41.8%), coronary artery disease (50.9%), and diabetes (47.3%) compared to victims without echocardiograms. None/trivial/trace insufficiency was present in 27 victims (50.9%), mild insufficiency in 18 (34.0%), and moderate-severe insufficiency in 8 (15.1%). There was no association between severity of mitral insufficiency with demographic covariates or comorbid conditions. The presence of structural mitral valve abnormalities, including thickened leaflets, calcification, and redundancy of the mitral valve, were present in only 8 (12.5%) of 64 victims with autopsies. In a control group of 1101 date-matched patients from the same county, 57 (4.8%) patients had an echocardiogram available. 14 (24.6%) of these patients had mild-moderate mitral insufficiency.

Conclusion: Mitral insufficiency and structural abnormalities of the mitral valve are often identified in echocardiograms or autopsies of sudden death victims. Living controls had approximately half the prevalence of mitral insufficiency, suggesting that mitral dysfunction and its associated comorbidities are associated with sudden death.