IMAGING AND DIAGNOSTIC TESTING

FIRST DOCUMENTATION OF CARDIAC DYSFUNCTION FOLLOWING EXPOSURE TO THE WORLD TRADE CENTER DISASTER

ACC Poster Contributions
Georgia World Congress Center, Hall B5
Monday, March 15, 2010, 3:30 p.m.-4:30 p.m.

Session Title: General Echocardiography: Right Heart Function Evaluation by Strain
Abstract Category: General Echocardiography: TTE
Presentation Number: 1199-200

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Background: Law enforcement personnel working at the World Trade Center (WTC) were exposed to fine particulate matter following the 9/11 tragedy. Exposure to increased inhaled particulate matter causes both pulmonary and cardiac dysfunction. Diastolic dysfunction may be a manifestation of subclinical cardiac disease. The purpose of this study was to assess left ventricular (LV) and right ventricular (RV) diastolic function in law enforcement personnel exposed to Ground Zero.

Methods: Mount Sinai WTC screening program is assessing the cardiovascular impact from exposure to Ground Zero. Subjects screened from Jan 2008 through June 2009 received a complete echo Doppler study including transmitral E/A and tissue Doppler imaging (TDI) of the LV septum and RV free wall in the apical four chamber view. Diastolic dysfunction was defined as LV E/A, LV TDI e’/a’ and RV TDI <1 or LV E/e’ ratio > 10. Only subjects in sinus rhythm, EF >45%, and BMI < 30 kg/m2 were included in the primary analysis. For secondary LV analysis, subjects over the age of 50 or with hypertension, on hypertensive medications, or elevated blood pressure at screening were excluded. For secondary RV diastolic function analysis, smokers and subjects with LV diastolic dysfunction were excluded.

Results: For the primary analysis, 1191 subjects were screened who had a mean age 44.8 ± 5.6 years and mean BMI 30.2 ± 5.1 kg/m2. Of the 1191 subjects, 61% had LV diastolic dysfunction and 63% had RV diastolic dysfunction. Secondary analysis, excluding hypertensive subjects over 50 years old, 47% had LV diastolic dysfunction. This is significantly greater than the 7% reported in population studies of same aged subjects. After excluding smokers and those with LV diastolic dysfunction, 12% had isolated RV diastolic dysfunction.

Conclusion: WTC law enforcement personnel have an increased prevalence of LV diastolic dysfunction compared to reported literature as well as isolated RV diastolic dysfunction. While Ground Zero exposure has been shown to produce pulmonary complications, this is the first demonstration of the potential cardiac impact of the WTC tragedy. The etiology of their diastolic dysfunction and its clinical impact require further investigation.