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Non Invasive Imaging

VASCULAR INFLAMMATION BY [18F]-FLUORODEOXYGLUCOSE POSITRON EMISSION TOMOGRAPHY-COMPUTED TOMOGRAPHY IS ASSOCIATED WITH AORTIC WALL PROPERTIES BY MAGNETIC RESONANCE IMAGING

Poster Contributions

Hall C

Saturday, March 29, 2014, 10:00 a.m.-10:45 a.m.

Session Title: Cardiac Positron Emission Tomography: Current and Newer Applications

Abstract Category: 16. Non Invasive Imaging: Nuclear

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Background: Psoriasis is an inflammatory skin disease associated with cardiovascular (CV) events likely related to increased helper T-cell activity. Aortic vascular inflammation (VI) by [18F] Fluorodeoxyglucose Positron Emission Tomography-Computed Tomography (PET/CT) predicts future CV events and is increased in psoriasis. Furthermore, increased aortic wall thickness and decreased aortic distensibility by Magnetic Resonance Imaging (MRI) predict future CV disease. How these validated MRI metrics of the aorta relate to VI is unknown. Therefore, we aimed to utilize a sample with increased VI to characterize wall thickness and distensibility to further our understanding of these imaging outcomes.

Methods: Whole-body PET/CT and MRI exams were obtained in patients with psoriasis (n=53). To measure VI, 2 dimensional regions of interest were placed on PET images to measure the maximal aortic standard uptake value (SUVmax) [Extended Brilliance Workstation, Phillips Healthcare]. To measure wall thickness, wall boundaries of the thoracic descending aorta were traced on each MRI slice [Qplaque, Medis], and to measure distensibility, descending aorta contours were traced throughout the cardiac cycle [Qflow, Medis]. The relationship between VI, distensibility and wall thickness were analyzed for unadjusted (Spearman's rho) and adjusted (multivariable linear regression) using STATA 12.

Results: Despite low Framingham 10-year risk scores in our cohort (males mean 6.9, SD 5.4; females mean 4.5, SD 4.3; p=0.11), the VI was high (SUVmax 5.9 +/- 0.5) consistent with increased plaque activity. CV risk factors were associated with SUVmax, wall thickness and distensibility (p<0.01 for all). After adjusting for age, sex, diabetes, hypertension, hyperlipidemia, tobacco, alcohol use and body mass index, both plaque index ($\beta = 8.75$, p < 0.001), and distensibility ($\beta = -24.7$, p < 0.001) were independently associated with VI.

Conclusions: In psoriasis, we confirm increased VI that may be associated with structural and functional abnormalities of the aorta. However, larger ongoing outcome studies will inform biological significance of these findings.