Abstract: **P306**

**Molecular imaging of vascular osteogenesis in patients infected with HIV**

**Authors:**
P Raggi¹, N Prandini², F Esposito³, A Malagoli³, J Milic³, B Beghetto³, G Nardini³, E Roncaglia³, G Guaraldi³, ¹Mazankowski Alberta Heart Institute - Edmonton - Canada, ²University of Modena & Reggio Emilia, Nuclear Medicine - Modena - Italy, ³University of Modena & Reggio Emilia, Modena HIV Metabolic Clinic - Modena - Italy,

**Topic(s):**
Positron Emission Tomography (PET)

**Citation:**

Background: Initiation and progression of atherosclerosis are dynamic and complex processes involving infiltration of lipids, inflammation and calcification in the subintimal space. We performed molecular imaging of arterial calcification with 18F-Sodium Fluoride (NaF) in 50 patients infected with HIV to detect active arterial osteogenesis. NaF has been shown to accumulate actively in growing areas of hydroxyapatite and in culprit plaques of patients with acute coronary syndromes.

Material & Methods: We enrolled 50 HIV+ patients (84 % men, mean age 57+8) who had undergone 2 cardiac computed tomography scans at least 2 years apart to measure coronary artery calcium (CAC) progression. Tracer uptake was analyzed semi-quantitatively as target-to-background ratio (TBR) using a cut-off of 1.6 in 6 arterial territories: aortic arch, innominate carotid artery, right and left internal carotid arteries, left anterior descending and right coronary artery. The Spearman correlation coefficient was used for statistical correlation of tracer uptake with CAC progression and non-progression.

Results: NaF uptake (Figure 1) was observed in 49 (98%) of the 50 study patients and in 149 (50%) of 300 arterial territories; the mean TBR was 1.75 ± 0.62. NaF uptake was detected 92 times (62%) in areas without CAC and 57 times (38%) in areas with CAC. Nineteen patients showed CAC progression and 30 did not. NaF uptake was observed 32% of the times in patients without CAC progression and 68% of the times in patients with CAC progression. The Spearman correlation coefficient between no-CAC progression and NaF uptake was -0.56 (p = 0.01). Conversely, the Spearman correlation coefficient between CAC progression and NaF uptake was 0.20 (p = 0.33). There was no correlation between any clinical and demographic variables and NaF uptake.

Conclusions: In 50 HIV infected patients on stable anti-retroviral therapy, PET imaging with NaF detected several areas of arterial uptake in the absence of macroscopic calcification. However, active NaF uptake at one time point did not appear to correlate with progression of CAC measured prior to PET imaging. This suggests that CAC progression is not necessarily ongoing and detectable by a functional test, such as molecular imaging with NaF, performed at one time point, and patients go through periods of active calcification and quiescence.
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