Abstract: 1933

18F-Flutemetamol PET/MR imaging of cardiac amyloidosis

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Background: Non-invasive diagnosis of cardiac amyloidosis by means of nuclear imaging is gaining acceptance as an alternative to endomyocardial biopsy. The diagnostic accuracy of bone-tracer scintigraphy for the detection of transthyretin-related cardiac amyloidosis approaches 100%. Positron emission tomography (PET) with amyloid-binding tracers has the advantage of detecting both common types of amyloid deposits, i.e. light-chain (AL) and transthyretin (TTR) with a reported sensitivity of 95% and a specificity of 98% in a recent meta-analysis. Cardiac magnetic resonance (MR) imaging is another established method that provides insight into myocardial structure and performance, especially with the introduction of myocardial T1 mapping. In our study, we describe the first time use of 18F-Flutemetamol PET/MR imaging in a series of patients with diagnosed or suspected cardiac amyloidosis.

Methods: The study included patients with known or suspected cardiac amyloidosis. All study participants underwent PET/MR imaging in a 3 Tesla hybrid system with estimation of tracer-uptake (SUV mean and SUV max of the basal septum), late gadolinium enhancement, T1 global relaxation time and extracellular volume (ECV). Two nuclear specialists blinded for the results of any available biopsies prior PET/MR imaging analyzed the studies.

Results: We included four patients with cardiac amyloidosis (three patients with TTR-Amyloidosis and one with AL-Amyloidosis) and four patients with suspected cardiac amyloidosis and negative histologic results of cardiac biopsy or abdominal fat pad aspirate. The mean age of the amyloidosis patients was 67 (61-77) years and the mean age of patients with suspected amyloidosis was 76 years (67-84). Average myocardial SUV max in the amyloidosis group was 2,24 compared to 1,86 in the comparison group (p=0.15). Average myocardial SUV mean was 1,85 and 1,39, respectively (p=0.07). T1 relaxation time and ECV were higher in amyloidosis patients (1484,7 vs. 1347,9 sec, p=0.07 and 60,6 % vs. 39,4 %, p=0.08, respectively).

Conclusions: 18F-Flutemetamol PET may be an alternative to endomyocardial biopsy and has the potential to outperform scintigraphy due to the specific tracer-affinity to both common types of amyloid deposits. The diagnostic accuracy of PET/MR imaging should be further investigated in larger studies.