Cardiac Amyloid Quantification Using ^{124}I-Evuzamitide PET/CT Compared With ^{18}F-Florbetapir PET/CT

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Introduction

- Improved amyloid quantification could advance early diagnosis and treatment monitoring of amyloid cardiomyopathy (CMP) .
- ^{124}I-evuzamitide is a novel amyloid-specific radiotracer for PET/CT, targeting amyloid deposits of multiple types.
- However, the comparative ability of ^{124}I-evuzamitide vs. ^{18}F-florbetapir PET/CT to detect and quantify cardiac amyloid burden in amyloid CMP is still unclear.

▶ The aims of this study were:

- To quantify myocardial ^{124}I-evuzamitide uptake.
- To compare its diagnostic value to ^{18}F-florbetapir in participants with amyloid CMP and controls.

Methods

- This study included 44 participants:
  - 12 with light-chain (AL) CMP.
  - 12 with wild-type transthyretin (ATTRwt) CMP.
  - 20 controls without amyloidosis.
- CMP participants underwent PET/CT with both radiotracers ^{124}I-evuzamitide and ^{18}F-florbetapir (except 1 AL-CMP).
- Control participants underwent PET/CT with one of these radiotracers.
- Left ventricular percent injected dose (LV %ID) was calculated using the measured LV wall activity concentration above the blood pool:
  - *LV %ID = activity concentration x volume / injected activity*
- LV %ID quantifies the amount of radiotracer bound to LV amyloid, thus quantifies the LV amyloid burden.
- Normal LV %ID levels were defined using Youden's index.
- All CMP participants underwent echocardiography.
- 13 CMP participants underwent cardiac magnetic resonance imaging (MRI).

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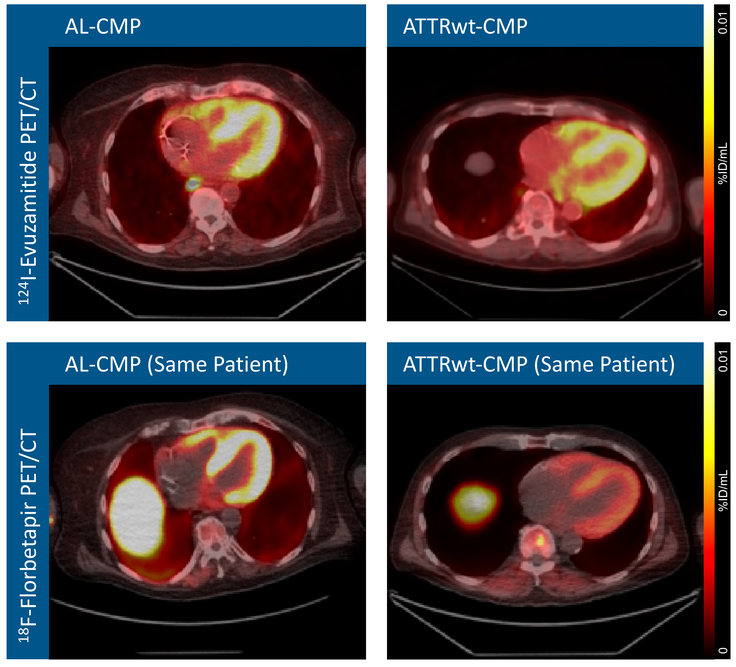
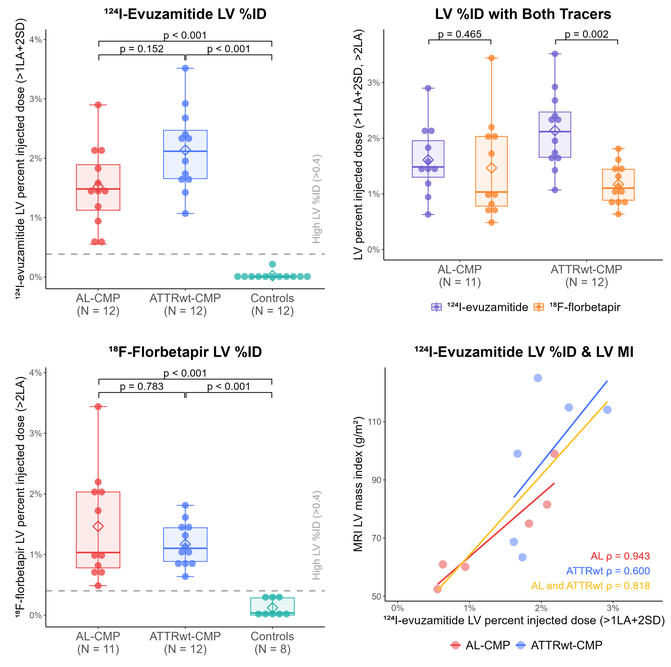
Results

- In CMP participants, median age was 74 years (IQR 69 – 78) and 92% were male.
- Median ^{124}I-evuzamitide LV %ID was 0.17 (IQR 0.07 – 0.45) in AL-CMP, 0.44 (0.35 – 0.75) in ATTRwt-CMP, and 0.00 (0.00 – 0.01) in controls ($p < 0.001$).
- High LV %ID perfectly discriminated CMP from controls, similar to ^{18}F-florbetapir.
- ATTRwt-CMP had higher ^{124}I-evuzamitide LV %ID ($p = 0.03$) and LV mass index ($p = 0.009$) than AL-CMP, but similar ^{18}F-florbetapir LV %ID ($p = 0.74$).
- ^{124}I-evuzamitide LV %ID was intermediately to strongly correlated with interventricular septal thickness ($\rho=0.78$) and LV strain ($\rho=0.54$) on echocardiography, as well as with LV mass index ($\rho=0.82$) and extracellular volume ($\rho=0.51$) on MRI.





Conclusion

- **^{124}I-evuzamitide detects amyloid CMP and accurately discriminates it from controls, with higher uptake in ATTRwt-CMP than in AL-CMP.**
- **Correlations with cardiac structural and functional metrics imply valid amyloid quantification.**

❖ **Hence, ^{124}I-evuzamitide is a promising radiotracer to detect and quantify cardiac amyloid in AL and ATTRwt amyloidosis.**

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