

diagnostic work-up of atypical Alzheimer disease: the AMY-ITA multicenter study

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Introduction

We investigated whether the early frames of the AMY-PET with Florbetaben-PET scan are comparable to the FDG-PET in terms of regional uptake deficits in patients with a clinical suspicion of atypical Alzheimer's disease.

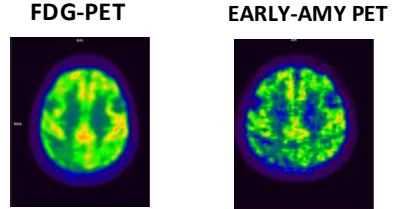


Figure 1: axial PET images with FDG and Florbetapir in the same patient

Materials and methods

AMY-ITA is a prospective multicenter study conducted in 9 Italian centres (Figure 2).



Figure 2: centers recruiting patients

100 patients with a clinical diagnosis of possible Alzheimer disease with atypical phenotype (Figure 3) have been enrolled, collecting clinical data, pre-scan provisional diagnosis, FDG-PET and AMY-PET images, rate of post-scan changed diagnoses.

Legend for Figure 3: coAD, PCA, PPA, FS, CBS, RPD, UD



Figure 3: Distribution of atypical phenotypes

Late AMY-PET images were analyzed with semiquantification using as standard reference a ROI included in the white matter and chosen using a data driven method. Data driven areas identified in early AMY-PET and FDG images were compared using PCA approach and compared.

Results

Most frequent clinical phenotypes were PPA and PCA. Figure 3

68% resulted positive to AMY-PET and clinicians changed the baseline clinical diagnosis in 27% of cases after the result of AMY-PET.

With semiquantification analysis the higher correlation was obtained with data from 5-min early AMY-PET ($\rho = 0.9$, $P < 0.0001$) respect to 10 or 15-min frames. Figure 4

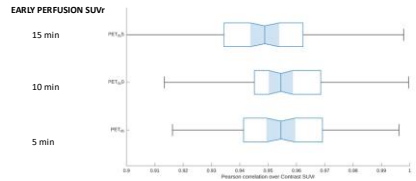


Figure 4: comparison between SUVR values from FDG-PET and different time points of acquisition of early frames AMY-PET

PCA-derived spatial patterns of hypoperfusion were associated with clinical syndromes as well as FDG-PET pattern (non-inferiority evaluation). Figure 5

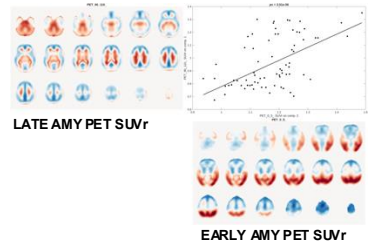


Figure 5: correlation between early and late AMY-PET patterns

Discussion and conclusion

Early-phase AMY-PET with florbetaben correlated well with FDG-PET scans in atypical forms of dementia, offering a surrogate marker of brain metabolism. AMY-PET with analysis of early frames may convey added information on metabolism thus reducing patient radiation exposure and health costs by avoiding FDG-PET.



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