Introduction

Quantitative analysis has been demonstrated to be an important aid in interpreting functional neuroimaging exams. The purpose of this study was to evaluate a newly released commercial software in comparison with an established (Avid semi-quant) method for standard uptake values ratio (SUVr) calculation in a cohort of Florbetapir PET images.

Methods

Subjects: 130 subjects (a sub-group of cases listed in Fleisher et. al. 2011)1
49 OHC – no cognitive complaints, >55 years of age, MMSE ≥ 29
45 AD – met National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer’s Disease and Related Disorders Association criteria for probable AD, MMSE 10 – 24 at screening
36 MCI – cognitive impairment not more than 1 year from screening visit, CDR 0.5, MMSE ≥ 24

Imaging: 10-min dynamic scans (2 x 5 minute frames) at 50-min post injection

Image Reconstruction: 4 iterations, 16 subsets, 128 x 128 matrix, Gaussian 5mm FWHM

Image Analysis

Registration to a single Florbetapir F 18 template (Clinically diagnosed HC and AD subjects, including subjects with Aβ+ and Aβ- scans)

Simultaneous registration to three Florbetapir F 18 templates (Aβ+, Average of Aβ+ and Aβ- scans)

SUVr Correlation

\[ R = 0.991 \]
\[ \text{MIMneuro} = 0.965 \times \text{SPM2} + 0.0045 \]

Conclusions

• The two methods are well correlated across the entire range of SUVr values.
• The slope and intercept of the regression line converting the literature method results to MIMneuro results approaches 1 and 0 respectively.
• The SUVr threshold defining an amyloid positive PET scan using both Avid semi-automated and MIMneuro is 1.10.
• This study suggests that MIMneuro is comparable to published Avid2 semi-automated SUVr analysis of Florbetapir images.

References