Florbetapir Processing Methods

Protas H, Su Y, Reiman EM, and the Alzheimer's Disease Neuroimaging Initiative
Banner Alzheimer's Institute,
Arizona State University, Translational Genomics Research Institute, University of Arizona, Mayo Clinic Arizona, University of California, Berkeley, University of California, San Francisco, and Arizona Alzheimer's Consortium, Phoenix, AZ, USA

Summary

Using ADNI florbetapir PET data, we previously demonstrated improved power to track longitudinal fibrillar Aβ changes and evaluate Aβ-modifying treatments using a cerebral white matter (Chen et al., 2015). Here we provide templated-based summary amyloid burden measures using both white matter and cerebellar referencing.

Methods

All images downloaded from LONI (http://adni.loni.usc.edu/methods/pet-analysis/pre-processing/) were fully preprocessed by Dr. Koeppe's team at University of Michigan (Co-registered dynamic, Averaged, Standardized Image and Voxel Size, and Uniform Resolution). The images were then spatially normalized to the SPM template using SPM8 (Wellcome Trust Center for Neuroimaging, UCL, UK) in MATLAB R2013a (Mathworks, Natick, MA). The in-house developed procedure was used to calculate the SUVR values in the template space with the cerebral white matter (MCSUVRWM) and the cerebellar reference regions (MCSUVRCERE). The white matter reference region was defined as eroded corpus callosum/centrum semiovale (Chen et al. 2015). The cerebellar reference region was the AVID defined whole cerebellum reference region, the target region is defined as the combined mean cortical region from six regions defined by AVID (temporal,anterior cingulate, orbital frontal, posterior cingulate, parietal,and precuneus) (Fleisher 2011)

Uploaded data:

We upload mean cortical SUVR values for both white matter and cerebellum reference regions included in this update and will provide frequent future updates when new images become available and analyzed.

Version Information

This is the document submitted from Banner Alzheimer Institute regarding the SUVR calculation using the developed cerebral white matter reference region for florbetapir PET image analysis.

Dataset Information

This methods document applies to the current data uploads and future updates to the BAI template based florbetapir PET analysis results.

ADNI Alzheimer's Disease Neuroimaging Initiative

About the Authors

This document was prepared by **Hillary Protas, Yi Su and Eric Reiman, Banner Alzheimer's Institute, Imaging Analysis**. For more information please contact **Hillary Protas (hillary.protas@bannerhealth.com)** or **Yi Su (yi.su@bannerhealth.com)**

Reference List

Chen, K., Roontiva, A., Thiyyagura, P., Lee, W., Liu, X., Ayutyanont, N. et al. (2015). Improved power for characterizing longitudinal amyloid-beta PET changes and evaluating amyloid-modifying treatments with a cerebral white matter reference region. J Nucl.Med., 56, 560-566.

Fleisher, A. S., Chen, K., Liu, X., Roontiva, A., Thiyyagura, P., Ayutyanont, N., . . . Reiman, E. M. (2011). Using positron emission tomography and florbetapir F18 to image cortical amyloid in patients with mild cognitive impairment or dementia due to Alzheimer disease. *Arch Neurol, 68*(11), 1404-1411. doi:10.1001/archneurol.2011.150