

Titre de l'étude

Identification de biomarqueurs sensibles à la progression de la maladie chez des patients MCI

Auteurs/PI/Institution/Labo

The PharmaCog Consortium

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Contexte/Objectif de l'étude

Protocole européen visant à établir une base de données multimodale (IRM-EEG-NPSY-Marqueurs biologiques, etc.) sur des patients atteints de Maladie d'Alzheimer probable, suivis tous les 6 mois pendant 2 ans

Prestation du Plateau Technique

Séquences :

3D T1 : 1*1*1 mm, 6mn49

AxT2 FLAIR : 0,8*0,8*4 mm, 04mn53

RsFMRI : 3*3*3mm 200dyn, TR=2,45s, 08mn20s

DTI : 2*2*2mm 30 directions, 9mn27

Période : février 2012 – avril 2015

Matériel :

- Antenne 32 CX
- Casque audio MR Confon

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Free Water Elimination Improves Test-Retest Reproducibility of Diffusion Tensor Imaging Indices in the Brain: A Longitudinal Multisite Study of Healthy Elderly Subjects

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Test-Retest Reliability of the Default Mode Network in a Multi-Centric fMRI Study of Healthy Elderly: Effects of Data-Driven Physiological Noise Correction Techniques

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Longitudinal reproducibility of default-mode network connectivity in healthy elderly participants: A multicentric resting-state fMRI study



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Longitudinal Reproducibility of Automatically Segmented Hippocampal Subfields: A Multisite European 3T Study on Healthy Elderly

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Multisite longitudinal reliability of tract-based spatial statistics in diffusion tensor imaging of healthy elderly subjects



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Brain morphometry reproducibility in multi-center 3 T MRI studies: A comparison of cross-sectional and longitudinal segmentations



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ABSTRACT

Large-scale longitudinal multi-site MRI brain morphometry studies are becoming increasingly crucial to characterize both normal and clinical population groups using fully automated segmentation tools. The test-retest reproducibility of morphometry data acquired across multiple scanning sessions, and for different MR vendors, is an important reliability indicator since it defines the sensitivity of a protocol to detect longitudinal effects in a consortium. There is very limited knowledge about how across-session reliability of morphometry estimates might be affected by different 3 T MRI systems. Moreover, there is a need for optimal acquisition and analysis protocols in order to reduce sample sizes. A recent study has shown that the longitudinal FreeSurfer segmentation offers improved within session test-retest reproducibility relative to the cross-sectional segmentation at one 3 T site using a nonstandard multi-echo MP-RAGE sequence. In this study we implement a multi-site 3 T MRI morphometry protocol based on vendor provided T1 structural sequences from different vendors (3D MP-RAGE on Siemens and Philips, 3D IR-SPGR on GE) implemented in 8 sites located in 4 European countries. The protocols used mild acceleration factors (1.5–2) when possible. We acquired across-session test-retest structural data of a group of healthy elderly subjects (5 subjects per site) and compared the across-session reproducibility of two full-brain automated segmentation methods based on either longitudinal or cross-sectional FreeSurfer processing. The segmentations include cortical thickness, intracranial, ventricle and subcortical volumes. Reproducibility is evaluated as absolute changes relative to the mean (%), Dice coefficient for volume overlap and intraclass correlation coefficients across two sessions. We found that this acquisition and analysis protocol gives comparable reproducibility results to previous studies that used longer acquisitions without acceleration. We also show that the longitudinal processing

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