SURVEY OF PROTOCOLS FOR MANUAL HIPPOCAMPAL VOLUMETRY: PREPARATORY STEPS FOR AN EADC-ADNI HARMONIZED PROTOCOL

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Aim: To identify differences among segmentation protocols and provide quantitative information supporting decisions for an international harmonized protocol.

Methods: We selected 12 most used hippocampal tracing protocols in the AD literature for evaluation. The same rater carried out complete tracings on two MR scans (one control, one matched AD ADNI subjects) on 1.2 mm slices, using each of the 12 protocols. We arranged individual interactive web conferences with the primary author of each protocol, to check the appropriate execution of the tracing, and correct it when necessary. Landmark differences were extracted from the semantically harmonized landmarks obtained from the certified protocols (available at www.hippocampal-protocol.net).

Results: The main differences between the protocols consisted in

(a) inclusion/exclusion of hippocampal white matter (alveus/fimbria)

(b) definition of the posterior most slice, and

(c) definition of the separation between the subiculum and the parahippocampal gyrus.

Heterogeneities in the definition of the boundary with the amygdala are no longer an issue due to the currently available software allowing 3D navigation.

Conclusions: These results are preparatory to an international consensus for a harmonized protocol for the manual tracing of the hippocampus.