

Cerebral atrophy in older adults with mild cognitive impairment with or without depressive symptoms and in patients with late-life depression

Eddy Larouche¹, Simon Duchesne², Carol Hudon³,

¹Université Laval, Quebec, Quebec, Canada; ²Université Laval and Centre de Recherche Université Laval - Robert Giffard, Quebec, Quebec, Canada; ³Laval University, Quebec, Quebec, Canada.

Background: The prodromal phase of Alzheimer's disease (AD) can be identified in older adults with Mild Cognitive Impairment (MCI) or Late-life depression (LLD). In order to elucidate the heterogeneity of prodromal AD, several studies have compared clinical characteristics of MCI and LLD. However, relatively few have investigated subjects with MCI and comorbid depressive symptoms (MCI/D+). On nosological grounds, there is a need to clarify the status of individuals with aMCI/D+ in relation to MCI or LLD (Steffens et al., 2006). The principal objective of this preliminary study is to examine cerebral morphological differences between MCI, MCI/D+ and LLD, as compared to healthy controls (HC). We restricted analyses to three regions of interest: hippocampus, entorhinal cortex and insula. **Methods:** Participants included 10 HC, 16 MCI, 21 MCI/D+ and 11 LLD. All groups were comparable in terms of age, education level and sex distribution. The MCI and MCI/D+ groups were identified based on Albert et al. (2011) criteria and differentiated using the Geriatric Depression Scale (cut-off = 8). Patients with LLD were identified based on DSM-IV criteria for major depression. 3D T1-weighted magnetic resonance images were acquired on a 3.0-Tesla Phillips using a standardized ADNI protocol and were analyzed using Freesurfer (5.3.0). Effect sizes (Cohen's d) were calculated to assess differences between HC and other groups in terms of cerebral atrophy. **Results:** Compared to HC, comparable levels of hippocampal atrophy were observed in MCI (d = .42), MCI/D+ (d = .42) and LLD (d = .45). Atrophy of the entorhinal cortex was somewhat greater in MCI (d = .49) and MCI/D+ (d = .53) than LLD (d = .31). Finally, insula atrophy was more extensive in LLD (d = .45) and MCI/D+ (d = .37) than in individuals with MCI (d = -.01). **Conclusions:** Overall, these preliminary findings suggest that beyond the hippocampus, MCI/D+ can be distinguished from MCI and LLD using cerebral atrophy measures. Indeed, entorhinal atrophy in MCI/D+ is different from that in LLD. Moreover, atrophy of the insula in MCI/D+ is greater than that in MCI. These findings support the hypothesis that MCI/D+ corresponds to a putative subtype of prodromal AD, but need to be confirmed in a larger cohort.