

Occipital atrophy signature in prodromal Lewy bodies disease

*Alice Galli*¹, A. Pilotto¹, B. Chiarini¹, M. Giunta¹, D. Corbo², C. Tirloni¹, E. Premi³, A. Lupini¹, C. Zatti¹, R. Gasparotti², A. Padovani¹

¹Neurology Unit, Department of Clinical and Experimental Sciences, University of Brescia, Brescia, Italy

²Department of Molecular and Translational Medicine, University of Brescia and ASST Spedali Civili Hospital, Brescia, Italy

³Stroke Unit, ASST Spedali Civili of Brescia, Brescia, Italy

Introduction: Dementia with Lewy Bodies (DLB) is characterized by prominent parieto-temporo-occipital brain atrophy but less is known about structural brain alterations in the newly defined prodromal phases [1,2].

Objective: Objective of the study was to evaluate gray matter volume and cortical thickness changes in prodromal DLB (p-DLB) and compare them with matched controls and full-blown dementia (DLB-DEM).

Methods: The study included 69 subjects, namely 42 DLB patients (n=20 p-DLB and n=22 DLB-DEM) and 27 age-matched Healthy Controls (HC). Each subject underwent an extensive cognitive and behavioral assessment and structural 3-tesla MRI. T1-MRI images were pre-processed to obtain gray matter (GM) and surface segmentation. Univariate analyses using Voxel-Based Morphometry (VBM) on GM and cortical thickness were implemented to evaluate the differences between p-DLB, DLB-DEM and HC in an age – sex and education-adjusted model.

Results: p-DLB showed reduced GM volume and thickness in occipital and posterior lateral parieto-temporal regions compared to HC. DLB-DEM exhibited prominent reduction in cortical volume and thickness in posterior lateral occipito-temporal regions, together with a frontal thinning when compared to HC. Covariate analyses covariance analysis using occipital lobe as the seed point showed a related pattern of atrophy in temporal and frontal lobe increasing from prodromal to dementia stage, at variance with HC.

Conclusions: Occipital atrophy signature is detectable since the prodromal phases of DLB and correlated with long-distance pattern of atrophy in related regions. Further longitudinal studies are warranted to confirm and extend these findings.

References:

- [1] McKeith IG, Ferman TJ, Thomas AJ, et al. Research criteria for the diagnosis of prodromal dementia with Lewy bodies. *Neurology* 2020;94:743–55.
- [2] Sarro L, Senjem ML, Lundt ES, et al. Amyloid- β deposition and regional grey matter atrophy rates in dementia with Lewy bodies. *Brain* 2016;139:2740–50.