SUPPLEMENTARY INFORMATIONS

TITLE

Autophagy and mitophagy biomarkers are reduced in sera of patients with Alzheimer's disease and mild cognitive impairment

AUTHORS

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To confirm the role of auto/mitophagy in our population of patients, another molecule, Beclin-1 [1,2] was measured in 80 subjects: 16 patients (8 females and 8 males) were analyzed for each subgroup.

Materials and methods

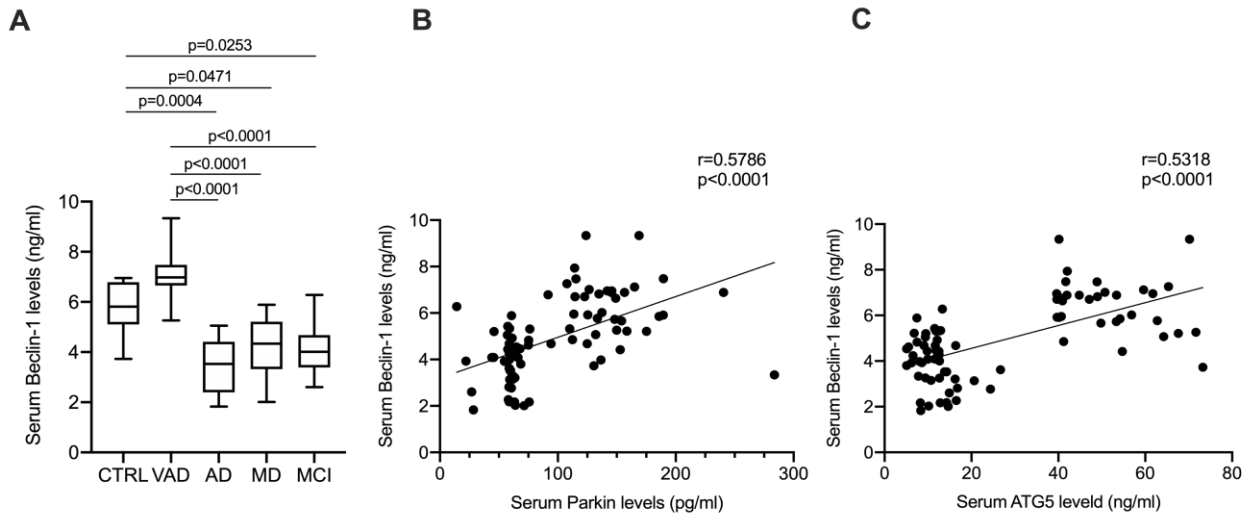
Serum levels of Beclin-1 determination

Serum concentrations of Beclin-1 were determined by using commercially available enzyme-linked immunosorbent assay kits (My Biosource MBS732891, San Diego, California, USA) following the manufacturer's instructions.

Results

Serum levels of Beclin-1

As reported in figure 2 (panel A) serum levels of Beclin-1 were statistically different among the groups (Kruskal-Wallis test: $p<0.0001$). In particular, serum median levels of Beclin-1 were more elevated in controls (53.69 ng/ml) than in AD (19.84 ng/ml), MD (30.47 ng/ml) and MCI (28.88 ng/ml) (Dunn's post hoc test: $p=0.0004$, $p=0.0471$ and $p=0.0253$, respectively) and in VAD and VAD (69.93 ng/ml) than in AD, MD and MCI (Dunn's post hoc test: all $p<0.0001$). Moreover, in all patients analyzed as a whole, serum levels of Beclin-1 were positively correlated to Parkin ($r=0.5786$) and to ATG5 ($r=0.5318$) (Spearman: both $p<0.0001$) (Figure 2, Panels B and C).



Supplementary Figure 1.

Serum levels of Beclin-1 in sera of patients affected by Alzheimer's disease (AD), vascular dementia (VAD), mild cognitive impairment (MCI), "mixed" dementia (MD) and without signs of cognitive impairment as sex-matched controls. **Panel A**: Beclin-1 levels were different among groups (Kruskall-Wallis; $p<0.0001$), in particular in post hoc analysis (Dunn's post hoc test) median ATG5 values were more elevated in Controls and VAD than in AD ($p=0.0004$ and $p<0.0001$), MCI ($p=0.0253$ and $p<0.0001$) and MD ($p=0.0471$ and $p<0.0001$). **Panel B** and **C**: Beclin-1 levels were positively correlated to Parkin and ATG5 concentrations ($r=0.5786$ and $r=0.5318$, respectively) (Spearman: both $p<0.0001$) in the patient population analyzed as a whole.

References for Supplementary Information

1 Liang, X. H. *et al.* Induction of autophagy and inhibition of tumorigenesis by beclin 1. *Nature* **402**, 672-676, doi:10.1038/45257 (1999).

2 Hill, S. M., Wrobel, L. & Rubinsztein, D. C. Correction to: Post-translational modifications of Beclin 1 provide multiple strategies for autophagy regulation. *Cell death and differentiation* **26**, 2810, doi:10.1038/s41418-019-0346-1 (2019).