Inverse relationship between education and amyloid burden in individuals with SCD plus and MCI

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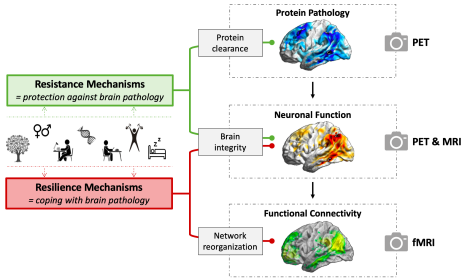
Background



Resistance:
Individuals with higher education carry a lower risk of developing AD likely due to resistance mechanisms such as, for instance, increased clearance mechanisms[1]

Resilience:
MCI and AD patients with higher education present greater AD pathology than lower educated patients with similar impairment pointing to compensatory mechanisms[2,3]

Aim

To determine the association between education level and amyloid burden in individuals with subjective cognitive decline plus

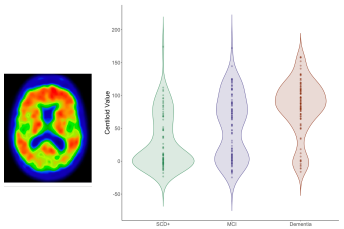
Methods

Demographic and amyloid PET data were retrieved from the AMYPAD DPMS cohort

Table 1 – Demographic characteristics

	SCD+ n= 85	MCI n= 108	AD n= 94	Group differences
Age	68.86 (5.98)	71.70 (8.09)	72.42 (8.48)	H(2)=14.99, p < .001*
Sex (M/F)	45/40	59/49	40/54	X2= 3.302, p=.192
MMSE	29.06 (1.1)	25.82 (3.1)	21.10 (4.7)	H(2)=170.86, p <.001*
Education	13.85 (1.00)	12.95 (3.45)	11.39 (3.82)	H(2)=21.33, p < .001*
Tracer FBB/FMT	47/38	58/50	58/36	X2= 1.421, p=.491
Global Centiloid	28.34 (40.9)	53.49 (47.8)	81.08 (43.4)	H(2)=50.55, p < .001*

MMSE=Mini mental state examination, FBB=Florbetaben, FMT=Flutemetamol.



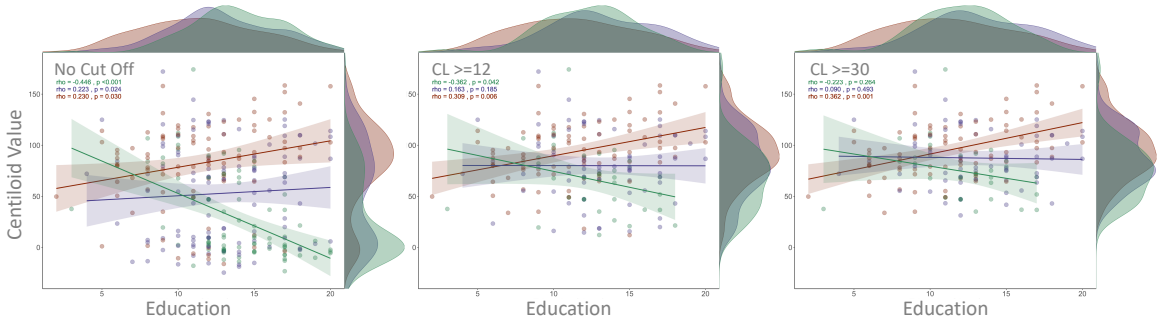
18F-Florbetaben or 18F-Flutemetamol were available for all subjects and transformed to Centiloid (CL) values for pooled analysis. Disitrubtions of CL values per group are depicted.

Statistical Analyses (p <.05) :

1) Spearman correlation analyses were conducted between years of education and global centiloid (CL) value applying no CL cut-off, and cut-offs for early (CL>=12) and marked (CL>=30) amyloid phases
2) To account for non-AD pathology, Chi squared tests were conducted between Fazekas scores (i.e. severity of white matter hyperintensities) and educational groups (Md split)

Results

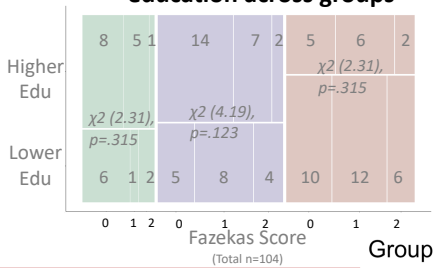
Higher education is associated with lower amyloid burden in SCD+ subjects, but greater pathology burden in clinical stages of AD



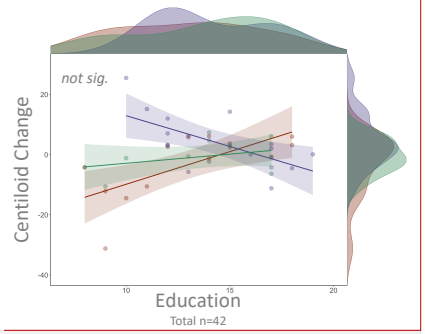
At subthreshold and early amyloid phases, an inverse relationship of education is observable across groups

At marked amyloid phases, the positive association in the clinical AD group remains

Severity of WMH not associated with education across groups



No significant effect of education on the longitudinal change in amyloid burden after 18 months FU in a subset of the studied cohort



Conclusion

- ✓ These results on one hand indicate that individual sensitivity to the effects of early amyloid accumulation on cognition may increase with higher education in potential preclinical stages of AD (i.e. SCD+) and on the other hand point at resistance mechanisms
- ✓ In contrast, higher education appears to support compensation to amyloid burden in early clinical stages of the disease, which is in line with previous findings on resilience in AD

References
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