

Baseline cerebrovascular reactivity in AD signature regions predicts conversion to MCI: a SPRINT MIND study

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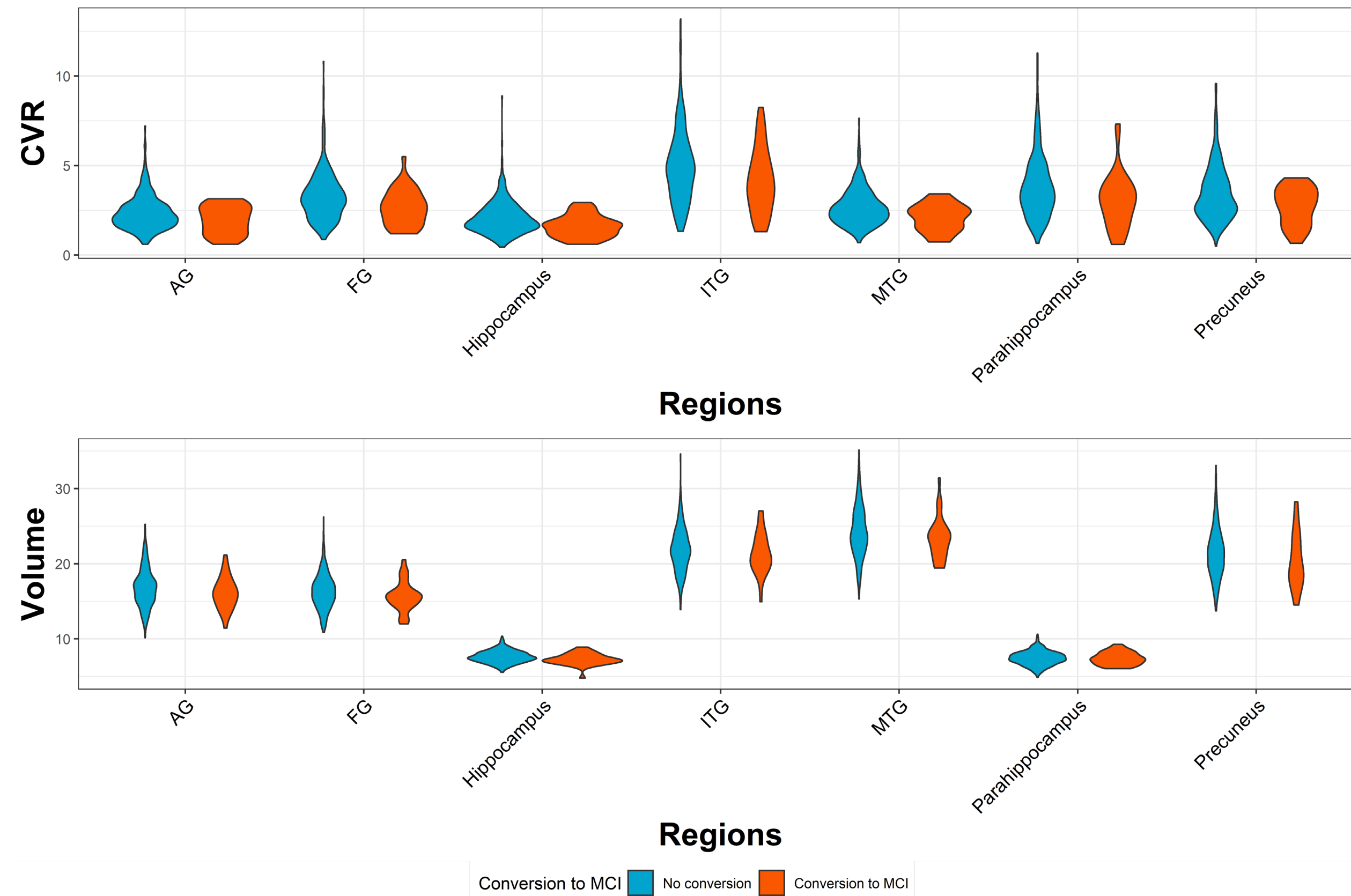
Background

- Cerebrovascular reactivity (CVR) is a measure of vascular responsiveness in the brain.
- Persons with MCI and AD have lower CVR compared to healthy older adults.
- The objective of this study is to explore the role of CVR in early stages of AD progression.
- We hypothesize that higher CVR in AD signature regions will be associated with lower rates of conversion to MCI.**

Methods

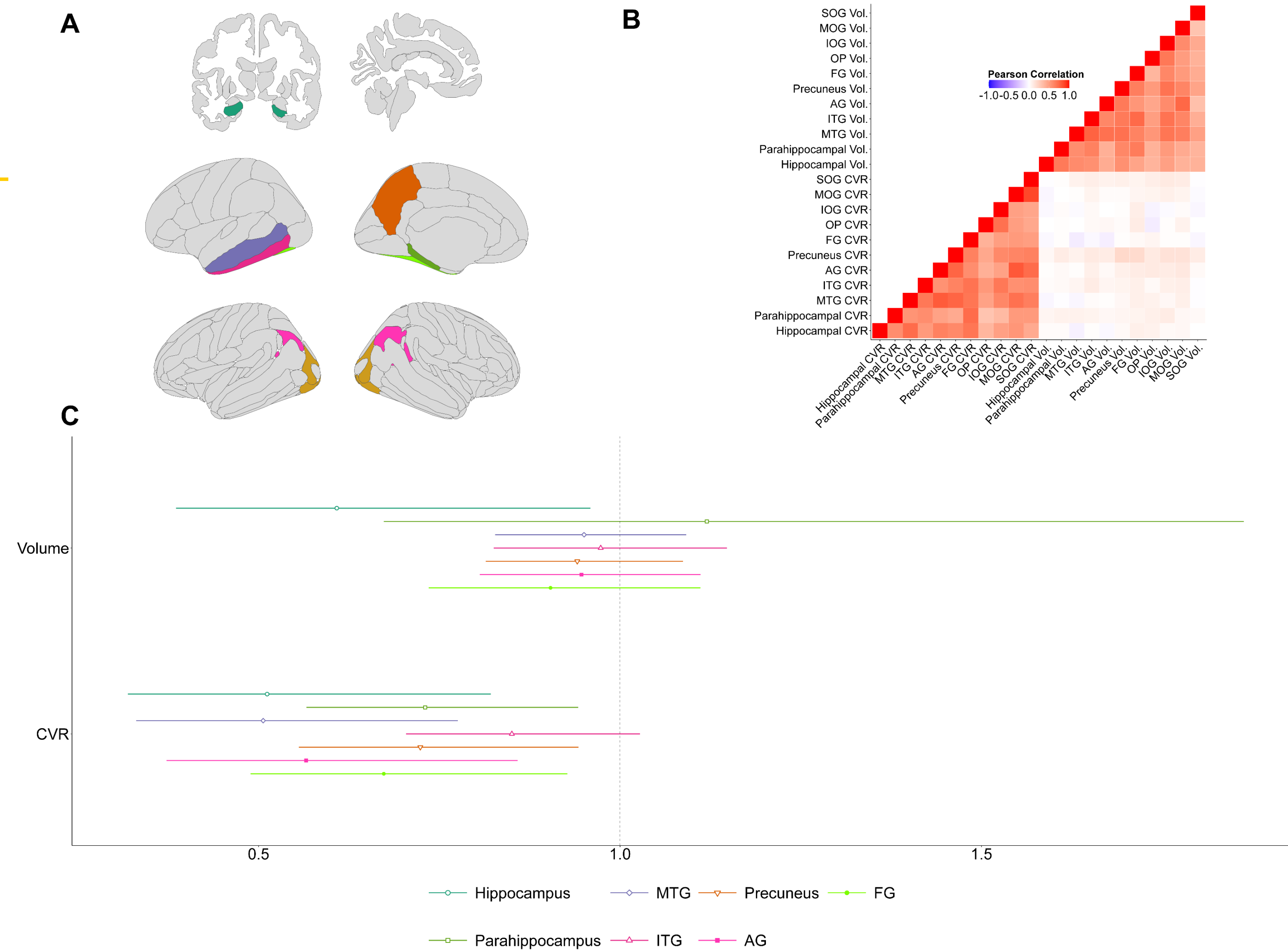
- 518 participants who underwent MRI imaging were selected from [SPRINT MIND](#) study.
- AD signature regions of interest:
 - Hippocampus, parahippocampus, precuneus
 - Fusiform (FG), middle temporal (MTG), inferior temporal (ITG) and angular gyri (AG)
- Occipital lobe was selected as control region
- Cox proportional hazards models tested the regional CVR—MCI risk associations
- Baseline age, sex, education, race, treatment assignment and regional brain volumes were covariates in the analyses

Cohort Characteristics at baseline



Variable	All	Non-converters	MCI converters	Effect Size	p value
N	518	477	34	-	-
Randomization (% High Intensity)	53.23%	52.89%	70.59%	0.09	0.05
Gender (% Male)	61.65%	62.19%	64.71%	0.01	0.77
Education (% College/ % Graduate Education)	51.08%/26.88%	51.65%/28.31%	47.06%/14.71%	0.12	0.03
MOCA	23.61 (4.02)	24.02 (3.60)	17.76 (5.05)	1.69	<0.01
Race (% Non-Hispanic Black/ %Hispanic)	31.54%/4.66%	30.37%/4.13%	35.29%/8.82%	0.07	0.49
Age (years)	67.39 (7.90)	67.14 (7.91)	71.00 (7.03)	0.49	0.01

Results



- Panel A) AD signature regions and occipital lobe
- Panel B) Correlations of regional CVR and volumes (note that CVRs are uncorrelated to volumes)
- Panel C) Hazard ratios of volume and CVR after adjusting for covariates
- No significant occipital lobe—MCI risk association was found**

Conclusion

- CVR is associated with lower rate of MCI progression**
- Participants with higher CVR converted to MCI at a significantly lower rate.**
- These associations implicate CVR as an early biomarker for dementia progression.**



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