

AGE-RELATED CHANGES IN THE POSTERIOR CINGULATE CORTEX FUNCTIONAL CONNECTIVITY: A RESTING-STATE FMRI STUDY IN ADULTS FREE OF NEUROPSYCHIATRIC DISORDERS

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Introduction: Studies of normal aging have shown age-related decreases in functional connectivity (FC) within the default mode network (DMN), particularly involving the posterior cingulate cortex (PCC). Although psychiatric conditions are common and underdiagnosed, none of these studies have combined psychiatric structured interview and neuropsychological evaluation to select the sample.

Objectives: to characterize age-related changes in PCC-FC connectivity in adults carefully screened to rule out neuropsychiatric disorders.

Methods: neuropsychiatric disorders were excluded by the Structured Clinical Interview for DSM-IV and neuropsychological evaluation. Resting-state functional MRI was acquired from 40, young, middle-age and elderly participants. After preprocessing, whole-brain, seed-based FC was estimated using a PCC seed. The relationship between age and PCC-FC was assessed using partial least squares.

Results: age was positively associated with PCC-FC in the left dorsolateral prefrontal cortex, bilateral supplementary motor area, right insula and left cerebellum; PCC-FC in these regions was negative or close to zero in young adults. PCC-FC of the medial part of the ventral prefrontal cortex was negatively associated with age; this region presented high positive PCC-FC in young adults (see figure).

Conclusions: age-related increases in PCC-FC were found in regions which are anti-correlated with the DMN, suggesting a decrease in the magnitude of anti-correlation. This may reflect a dedifferentiation process or weaker inter-network interactions. The careful sample selection prevents confounds related to neuropsychiatric disorders.

Figure (abstract). Boxplot of the functional connectivity between the posterior cingulate cortex and the five regions presenting significant age-related connectivity changes.

