Cognitive Fitness in Aging (COFITAGE), the open-access release of a neuroscience dataset

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Abstract

Understanding early brain aging requires integrating molecular, structural, physiological and cognitive measures within the same individuals. Subtle alterations in amyloid deposition, hippocampal structure, cortical microstructure and sleep-wake regulation may emerge years before clinical decline. However, few open-access datasets combine PET, MRI, sleep phenotyping, genetics and extensive cognitive assessment. The COFITAGE dataset addresses this gap by providing a multimodal, longitudinal resource in healthy late middle-aged adults, enabling investigation of interactions between amyloid and tau burden, brain structure, sleep physiology, cognitive reserve and cognitive trajectories.

The cohort includes 101 participants (33 men, 68 women) aged 50–69 years (mean 59.4 ± 5.3). Phenotypic data collected at baseline and 2-year follow-up include demographics, detailed sleep metrics (e.g., sleep stages, efficiency, awakenings) and a comprehensive neuropsychological battery covering memory, executive functions, attention, processing speed, language, mood and cognitive reserve proxies.

Baseline MRI acquisitions comprise anatomical (T1w, T2w), quantitative multi-parameter mapping (MTsat, PD, T1 maps with field maps) and diffusion imaging (multi-shell NODDI). PET imaging includes amyloid tracers (Florbetapir or Flutemetamol) and tau-sensitive tracers. All data were anonymized and organized according to the Brain Imaging Data Structure (BIDS) standard, ensuring reproducibility and interoperability.

COFITAGE uniquely combines multimodal imaging, sleep and cognition within a narrow age range, allowing investigation of preclinical brain aging. Its scientific value is supported by multiple publications on sleep, Alzheimer's biomarkers, cognition and cognitive reserve. It constitutes a robust open-access resource for multimodal and longitudinal research on early brain aging.