Associations of morphometric and metabolic biomarkers with cognitive impairment in Alzheimer's disease and Lewy body dementias

Abstract

Dementia has become one of the major health care and socio-economic challenges. Alzheimer's disease (AD) is the most common dementia whereas dementia with Lewy bodies (DLB) is the second most common neurodegenerative after AD. However, both dementias exist in a quite heterogeneous contiua that can overlap with each other. Approaches that allow for the identification of individuals at risk of developing AD in preclinical or prodromal stages are of major interest to apply the symptomatic and newly introduced biological therapies and non-pharmacological interventions that are more effective early on. Similar efforts are undertaken in the DLB field although no causal treatment for DLB is available yet. A prerequisite for an efficacious and targeted intervention is a selection of individuals who would benefit the most from this intervention. This process includes the timely and accurate diagnosis, differential diagnosis, prognostication, and management of treatable comorbidities. This dissertation has two parts. Part one is an overview of AD and DLB. The second part summarizes author's research work. The main research aims corroborated in this thesis are three-fold: First, to utilize experimental neuropsychology tests as potential markers of early AD stages and to determine their clinico-anatomical associations with brain imaging. Second, to describe cognitively normal older adults who may be at risk of developing clinically apparent AD using widely available brain imaging method that could predict positivity of well-established but expensive and invasive metabolic AD biomarkers. Third, because AD frequently overlaps with DLB, causing the diagnostic challenges and DLB patients to progress faster and survive shorter, work also aimed at using multimodality imaging in DLB to disentangle the DLB-related and AD-related imaging findings and their associations with clinical phenotype and disease progression.