Brain connectivity: the missing link between amyloid and clinical symptoms

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Name of Fellow

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Institution
Funder

ZonMw

Contact information of fellow
Country

The Netherlands

Title of project/programme

Brain connectivity: the missing link between amyloid and clinical symptoms

Source of funding information

ZonMw

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01/11/15

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2.0

The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

Alzheimer’s disease | brain networks | disease mechanism modelling | longitudinal study | magnetic resonance imaging | multimodal imaging

Research Abstract

Accumulation of amyloid is among the first changes leading to Alzheimer’s disease (AD). But, amyloid accumulation does not
predict cognitive decline. This has hampered the search for a cure. A novel view is needed to understand how and why brain areas become dysfunctional. connectivity can cause unexpected, widespread disruptions in brain function. Brain connectivity can be measured in vivo with magnetic resonance imaging (MRI) techniques. Other labs and I have found that brain connectivity deteriorates in Alzheimer’s disease, and that these disruptions predict cognitive decline cross-sectionally. Thus, brain connectivity shows promise to track disease progression. My aim is to model decline and improvement of brain connectivity in Alzheimer’s disease. I have two key objectives: 1. Model the longitudinal relationship of decline in brain connectivity and cognitive decline. 2. Predict future atrophy with brain
connectivity. Brain connectivity will be measured in single-subjects grey matter structural MRI, with a technique that I have invented during my PhD in the United Kingdom.
The conceivable outcomes of this study are: 1. brain connectivity as a marker that can track disease progression in AD, 2. prediction model for future atrophy.
Being able to predict when a patient will become demented is essential for treatment development. Prognostic information can be used to create more homogenous groups and so maximise treatment effects. Prognostic information will also help patients
and caregivers with disease management planning, thereby improving their quality of life.

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