Growth and Development of the Striatum in Huntingtons Disease

https://neurodegenerationresearch.eu/survey/growth-and-development-of-the-striatum-in-huntingtons-disease/

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Country

USA

Title of project or programme

Growth and Development of the Striatum in Huntingtons Disease

Source of funding information

NIH (NINDS)

Total sum awarded (Euro)

€ 2,724,703.67

Start date of award

01/07/2006

Total duration of award in years

2

The project/programme is most relevant to:

Huntington's disease

Keywords

Huntington Disease, Growth and Development function, Corpus striatum structure, Motor Skills, Parietal lobe gyrus

Research Abstract

DESCRIPTION (provided by applicant): This proposal is a competitive renewal for a unique study that measures the volume, function, and development of the striatum in children at risk for

Huntington’s Disease (HD). HD is a neurodegenerative disease caused by a DNA triplet repeat (CAG) expansion and manifests in cognitive, behavioral, and motor changes. Average age of onset is 40 yrs. The disease eventually affects most brain regions, yet the primary pathology is located in the striatum. Degeneration is a key component in the disease process, yet research in the past few years has supported the notion that a crucial component of the pathoetiology of HD is abnormal brain development. The grant was funded in 2009 to investigate this hypothesis by the study of children at risk for HD (those with a parent with HD). As HD is an autosomal dominant disease, each child has a 50% chance of inheritance. The at-risk participants are genotyped and those who are gene-expanded (GE) are compared to those who are gene non-expanded (GNE); a 3rd comparison group is healthy control children (HC) (no HD in family). Assessments include MRI and measures of motor function, cognitive skills, and behavior. The current proposal is designed to extend our studies by conducting a more thorough evaluation of the growth and development of the striatum. The original study evaluated volumes using structural Magnetic Resonance Imaging (sMRI) and white matter integrity using Diffusion Tensor Imaging (DTI). Results (shown in progress report) indicate volume deficits in the striatum with relative sparing or enlargement of the thalamus and cerebellum; and abnormal fractional anisotropy (FA) in multiple tracks. The new protocol will add: 1) evaluation of striatal resting state functional connectivity MRI (fcMRI), 2) Molecular measures of striatal integrity using (1)H magnetic resonance spectroscopy (MRS), and 3) the evaluation of developmental trajectories (growth between ages 6-18 years) of brain structure via an ‘accelerated longitudinal’ format. Compensatory mechanisms such as overgrowth of the cerebellum and thalamus will also be investigated. Functional assessment will include measures of cognition and motor skill. Information gained from this proposal could be key to identifying the earliest possible time-frame for neuroprotective interventions.

Lay Summary
PUBLIC HEALTH RELEVANCE: This proposal is a competitive renewal for a unique study that measures the volume, function, and development of the striatum in children at risk for Huntington’s Disease (HD). The disease eventually affects most brain regions, yet the primary pathology is located in the striatum. Degeneration is a key component in the disease process, yet research in the past few years has supported the notion that a crucial component of the pathoetiology of HD is abnormal brain development. The current proposal is designed to extend our studies by conducting a more thorough evaluation of the growth and development of the striatum.

Further information available at:

Types:
Investments > €500k

Member States:
United States of America

Diseases:
Huntington's disease

Years:
2016

Database Categories:
N/A

Database Tags:
N/A