NeuroIMAGE III * a follow-up study of an integrated DNA-cognition-MRI-phenotype cohort

Published: 09-04-2013
Last updated: 26-04-2024

The aim of this protocol is to invite the NeuroIMAGE cohort once more for a follow-up investigation and collect phenotypical, cognitive, and MRI data. This design offers the opportunity to examine by means of longitudinal phenotypic, cognitive, and...

Ethical review	Approved WMO
Status	Pending
Health condition type	Cognitive and attention disorders and disturbances
Study type	Observational non invasive

Summary

ID

NL-OMON37161

Source
ToetsingOnline

Brief title
NeuroIMAGE follow-up

Condition

- Cognitive and attention disorders and disturbances

Synonym
Attention-Deficit Hyperactivity Disorder

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Sint Radboud
Source(s) of monetary or material Support: EU 7e kaderprogramma

Intervention

Keyword: Attention-deficit Hyperactivity Disorder (ADHD), genetics, Magnetic resonance Imaging (MRI), persistence

Outcome measures

Primary outcome

Phenotyping will occur according to the procedures of the previous measurement and includes questionnaires and a semi-structured interview to determine the presence and severity of ADHD and comorbid disorders. These will be the primary outcome measures in most analyses.

The main predictors are:

1) Various MRI measures. The MRI scan consists of a 90-minute session (structural MRI, resting state, DTI, and fMRI (stop-task, reward-task, and a spatial working memory task)). Furthermore, an MRS session is included to measure levels of glutamate in the prefrontal cortex.

2) Outside the scanner, various additional cognitive tasks are administered (cognitive flexibility, verbal and visuo-spatial working memory, time reproduction, motor timing, motor control, intelligence, and positive and negative reward).

3) A blood sample will be acquired via a venipuncture to investigate biomarkers, gene expression and epigenetics.

Secondary outcome

not applicable

Study description

Background summary

Attention-deficit hyperactivity disorder (ADHD) is a neuropsychiatric disorder with a strong genetic background. From 2004-2006 a cohort of ADHD families (probands with ADHD combined type and one or more siblings) and control families (control probands with one or more siblings) was gathered. From 2009-2011 this cohort was invited for a follow-up investigation during which phenotypic and cognitive data was again collected, furthermore MRI brain scans were acquired (NeuroIMAGE cohort, CMO file number: 2008/163; NL23894.091.08). ADHD has a variable time course, with most cases of ADHD persisting into adulthood and some remitting. In many cases, comorbid disorders such as substance abuse, behavioral addictions, and disorders of compulsivity develop during adolescence. Fronto-striatal pathways in the brain are implicated in ADHD. However, it is unknown to what extent the development of fronto-striatal pathways predict the persistence of ADHD and the development of the previously mentioned comorbid disorders. The fronto-striatal circuits are notable for their relatively rich glutamatergic receptor density.

Study objective

The aim of this protocol is to invite the NeuroIMAGE cohort once more for a follow-up investigation and collect phenotypical, cognitive, and MRI data. This design offers the opportunity to examine by means of longitudinal phenotypic, cognitive, and MRI data to what extent and which aspects of the fronto-striatal circuits predict persistence versus remittance of ADHD and the development of compulsivity, to examine the role of glutamate and the role of genetic and epigenetic factors and biomarkers.

Study design

Prospective follow-up of approximately 800 participants (ADHD as well as controls and their siblings) from the NeuroIMAGE cohort from 2013-2015 (interval 3-4 years). The participants will be aged between 14-27. All were previously measured between 2009-2011 (aged 10-23 at the time) and 2004-2006 (aged 5-18 years at the time). We expect that 75% of the cohort (N=600) will participate.

The data will be primarily analyzed with multiple regression models on the whole sample (N=600), with the phenotypic measures of ADHD symptoms, impulsivity, compulsivity and addiction as dependent measures, and the structural, functional, and connectivity MRI en MRS measures as the main predictors. This sample size allows us to include up to 40 predictors. With

this sample size we have more than 90% power (alpha=.01) to detect very small beta*s. Similarly applies for analyses on binary outcomes in logistic regression or Cox regression models.

Study burden and risks

Some discomfort might occur during the venipuncture, recalling psychiatric symptoms, and the MRI scan (such as exposure to loud noise and lying in a small space). Participants can practice in a so called dummy-scanner. Some participants might benefit from an early identification of not previously identified psychiatric problems. In case structural abnormalities of the brain are detected on the MRI scan, the involved participant and general practitioner will be informed and everything will be made possible for an adequate further examination and treatment.
*

Contacts

Public
Universitair Medisch Centrum Sint Radboud

Kapittelweg 29
GC Nijmegen 6525
NL
Scientific
Universitair Medisch Centrum Sint Radboud

Kapittelweg 29
GC Nijmegen 6525
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age

Adolescents (12-15 years)
Adolescents (16-17 years)
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Participation in previous IMAGE and NeuroIMAGE investigation.
Inclusion at start of first investigation (IMAGE):
- ADHD-group: combined ADHD diagnosis
- control group: no ADHD diagnosis, no ADHD in family for the last 2 generations
- at least 1 sibling
- caucasian family for 2 generations

Exclusion criteria

- not willing to give informed consent
- not willing to give permission that the general practitioner is informed in case of incidental findings

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-02-2013
Enrollment:	600
Type:	Anticipated

Ethics review

Approved WMO Date:	09-04-2013
Application type:	First submission
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)
Approved WMO Date:	09-07-2014
Application type:	Amendment
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
CCMO	NL41950.091.12