On the relationship between brain structure and oscillatory activity in ADHD children

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Within the domain of spatial attention, it has been shown that changes in neuronal synchronization are fundamental to implement the mechanisms required for selective gating. Specifically, modulations in the alpha (8-13Hz) and gamma band (30-90Hz)...

Ethische beoordeling	Positief advies
Status	Werving gestopt
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON27284

Bron
Nationaal Trial Register

Verkorte titel
SHARK2

Aandoening

ADHD

Ondersteuning

Primaire sponsor: Donders Institute Nijmegen
Overige ondersteuning: Marie Slodowska Curie

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

-oscillatory power modulation during attentional performance
- DTI measures - FA and volume of major tracts associated with dopaminergic signaling (focus on Superior Liongitudinal Fasciculus)
- striatal brain volume

Toelichting onderzoek

Achtergrond van het onderzoek

Within the domain of spatial attention, it has been shown that changes in neuronal synchronization are fundamental to implement the mechanisms required for selective gating. Specifically, modulations in both the alpha (8-13Hz) and gamma band (30-90Hz) are predictive of performance in spatial attention tasks. Studies have reported that patients with Attention Deficit and Hyperactivity
Disorder (ADHD) show a reduced ability to modulate alpha band oscillations during covert attention, when compared to controls5. Stimulant medications (e.g. Methylphenidate) often provide effective treatment for ADHD symptoms, while little is known about the neuronal mechanisms by which they exert their effect. Given the role of neuronal oscillatory modulations in attentional performance, pharmacological intervention is expected to normalize the eventual differences in alpha and gamma band synchronization between ADHD patients and healthy subjects. Furthermore, investigation of anatomical differences between the two groups is performed to
identify the brain structures responsible for top-down attentional modulation.

Doel van het onderzoek

Within the domain of spatial attention, it has been shown that changes in neuronal synchronization are fundamental to implement the mechanisms required for selective gating. Specifically, modulations in the alpha (8-13Hz) and gamma band (30-90Hz) are predictive of performance in spatial attention tasks. Studies have reported that patients with Attention Deficit and Hyperactivity Disorder (ADHD) show a reduced ability to modulate alpha and gamma band oscillations during covert attention, when compared to controls. In addition, power modulation in the beta (15-30Hz) and Mu (9-11Hz) frequency bands, have also been shown to differ between controls and ADHD, hence indexing aberrant stimulus processing and motor activity. Stimulant medications (e.g. Methylphenidate) often provide effective treatment for ADHD symptoms, while little is known about the neuronal mechanisms by which they exert their effect. Given the role of neuronal oscillatory modulations in attentional performance, pharmacological intervention is expected to normalize the eventual differences in brain oscillations between ADHD patients and healthy subjects. Furthermore, investigation of anatomical differences between the two groups is performed to identify the brain structures responsible for top-down attentional modulation.

Onderzoeksopzet

- variables measured during experiment

for ADHD, MEG and MRI data measured on and off (placebo) medication (1 week between two recordings)

Onderzoeksproduct en/of interventie

on/off medication (placebo / active medication(methykphenidate)) for the ADHD group.
no intervention for control group.

Contactpersonen

Publiek

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Wetenschappelijk

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

controls

- 8-12 years old

- male

- no psychiatric dysorder

- IQ >80

ADHD

- diagnosis of ADHD (DSM IV)

- score in clinical range of ADHD rating scale

- Pharmacological treatment with Stimulant medication for the treatment of ADHD (either long- or shortacting
formulations), which started at least 3 months before the inclusion in the study.

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

(1) Neurological disorders (e.g. epilepsy) currently or in the past.

(2) Cardiovascular disease currently or in the past.

(3) Serious motor or perceptual handicap.

(4) Standard MRI Exclusion criteria according to DCCN regulations.

The presence of comorbid symptoms will be documented: for the control group, by scores for problem
behaviours on the Childhood Behavior Checklist (CBCL) , completed by the parents; For the ADHD group
a psychiatrist from the Karakter Instituut will perform a clinical evaluation assessing eventual comorbities.

Onderzoeksopzet

Opzet

Type:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Cross-over
Toewijzing:	Gerandomiseerd
Blindering:	Dubbelblind
Controle:	Placebo

Deelname

Nederland

Status:	Werving gestopt
(Verwachte) startdatum:	01-09-2016
Aantal proefpersonen:	60
Type:	Werkelijke startdatum

Voornemen beschikbaar stellen Individuele Patiënten Data (IPD)

Wordt de data na het onderzoek gedeeld: Nog niet bepaald

Ethische beoordeling

Positief advies

Datum:	20-02-2017
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

ID: 43451
Bron: ToetsingOnline
Titel:

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL6157
NTR-old	NTR6304
CCMO	NL56007.091.15
OMON	NL-OMON43451

Resultaten