

Brain Connectivity in Attention Deficit Hyperactivity Disorder (ADHD) (BCADHD)

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ClinicalTrials.gov Identifier: NCT03709940

Recruitment Status : Completed

First Posted : October 17, 2018

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Sponsor:

King's College London

Collaborator:

Shire

Information provided by (Responsible Party):

King's College London

• Study Details

- [Tabular View](#)
- [No Results Posted](#)

- [Disclaimer](#)
- [How to Read a Study Record](#)

Study Description

Go to ▼

Brief Summary:

This study investigates whether a relationship exists between pre-treatment brain characteristics and treatment response in adults with Attention Deficit Hyperactivity Disorder (ADHD).

Condition or disease

Attention Deficit Hyperactivity Disorder (ADHD)

Detailed Description:

There is a pressing need in psychiatry to offer more individualised treatments, and to improve outcomes from clinical trials. This 'individualised medicine' approach requires the development of biomarkers of treatment response.

60 adults with ADHD are recruited from the Adult ADHD Clinic at the Maudsley Hospital, London, United Kingdom.

The study is developed over three sessions, two at baseline (DAY 1 and DAY 2) and one after two months of treatment (follow-up).

The first two sessions are conceived as a single-blind non-randomised placebo-controlled cross-over experiment. The first 30 participants enrolled in the study receive a placebo tablet (ascorbic acid 50 mgs) on DAY 1 before the behavioural assessment and magnetic resonance imaging (MRI) scan. The behavioural assessment and the functional MRI measurements are repeated two days after (DAY 2), under a clinically effective dose (20 mgs) of short-acting methylphenidate (MPH).

The order of the tablets is reverted for the remaining 30 participants to balance any potential expectation and practice effect between the two conditions. Placebo and medication are over-encapsulated with the same red opaque capsules by the pharmacy team. Also, the protocol followed during the two sessions is absolutely identical

in respect of timing and tests administered in order to keep the participants blind to the drug condition (medication or placebo).

After the scanning sessions, all the participants receive the same prescription of a long-acting formulation of MPH, according to the clinical guidelines adopted by the Maudsley Hospital. Treatment response is evaluated clinically and behaviourally after 2 months of treatment (follow-up). Pre-treatment brain characteristics are tested as potential predictors (biomarkers) of treatment response.

Study Design

Go to ▼

Study Type : Interventional (Clinical Trial)

Actual Enrollment : 60 participants

Allocation: Non-Randomized

Intervention Model: Crossover Assignment

Intervention Model Description: 30 participants with Attention Deficit Hyperactivity Disorder (ADHD) undergo behavioural tests and brain scanning twice, once under placebo and once under an acute dose of methylphenidate (MPH). The order of the tablets is inverted for the second half of the sample, thus the last 30 participants undergo behavioural tests and brain scanning twice, once under an acute dose of MPH and once under placebo. All 60 participants are then treated with a long-acting formulation of MPH used routinely at the Adult ADHD Clinic.

Masking: Single (Participant)

Masking Description: The first part of the study (DAY 1 and DAY 2) is conceived as a single-blind placebo-controlled cross-over experiment. Participants are blind to the order of the tablets (placebo and MPH). After the two scanning sessions, all 60 participants are started on a long-acting formulation of MPH used routinely at the Adult ADHD Clinic (open trial phase).

Primary Purpose: Other

Official Title: Brain Connectivity in Attention Deficit Hyperactivity Disorder (ADHD): a Biomarker to Predict Treatment Response

Actual Study Start Date : May 3, 2013

Actual Primary Completion Date : January 15, 2015

Actual Study Completion Date : March 10, 2016

Resource links provided by the National Library of Medicine

[MedlinePlus](#) related topics: [Attention Deficit Hyperactivity Disorder](#)

[Drug Information](#) available for: [Methylphenidate](#) [Methylphenidate hydrochloride](#)

[U.S. FDA Resources](#)

Arms and Interventions

Go to ▼

Arm	Intervention/treatment
Experimental: Placebo, MPH	Drug: MPH Participants undergo behavioural tests and brain scanning twice, once under placebo and once under an acute dose of MPH, before

<p>Dose order: placebo, methylphenidate (MPH)</p> <p>Participants receive a placebo tablet (ascorbic acid 50 mgs) on DAY 1 and a clinically effective dose of short-acting MPH (20 mgs) on DAY 2.</p>	<p>starting long-term treatment with a long-acting formulation of MPH used routinely at the Adult ADHD Clinic.</p> <p>Other Name: Methylphenidate</p>
<p>Experimental: MPH, Placebo</p> <p>Dose order: methylphenidate (MPH), placebo</p> <p>Participants receive a clinically effective dose of short-acting MPH (20 mgs) on DAY 1 and a placebo tablet (ascorbic acid 50 mgs) on DAY 2.</p>	<p>Drug: MPH</p> <p>Participants undergo behavioural tests and brain scanning twice, once under placebo and once under an acute dose of MPH, before starting long-term treatment with a long-acting formulation of MPH used routinely at the Adult ADHD Clinic.</p> <p>Other Name: Methylphenidate</p>

Outcome Measures

Go to ▼

Primary Outcome Measures :

1. Diffusion imaging-based measurements as statistically significant predictors of treatment response (i.e. of participants' performance on adult ADHD rating scale at follow-up as compared to baseline).
[Time Frame: In the month 2-3 following the last scan.]

Diffusion based measurements include specific measures of anatomical connectivity of pathways originating in the frontal lobes, such as the fronto-striatal pathways and the superior longitudinal fasciculus. According to previously published criteria, treatment response is defined as a symptomatic improvement of at least 30%, as measured by participants' performance on adult ADHD rating scale at follow-up as compared to baseline.

Secondary Outcome Measures :

1. Functional connectivity measurements as statistically significant predictors of treatment response (i.e. of participants' performance on adult ADHD rating scale at follow-up as compared to baseline).
[Time Frame: In the month 4-5 following the last scan.]

Functional connectivity measurements include the strength of functional connectivity along pathways originating in the frontal lobes, such as the fronto-striatal pathways and the attentive networks. Treatment response is defined as in outcome 1.

2. Diffusion imaging-based measurements as statistically significant predictors of treatment response defined by a data-driven approach. [Time Frame: In the month 6-7 following the last scan.]

A categorical approach (data-driven analysis using multivariate k-mean clustering) is used to define treatment response on the basis of clinical and behavioural characteristics at follow-up. Clinical characteristics include participants' performance on adult ADHD rating scale at follow-up as compared to baseline, whereas behavioural characteristics include participants' performance on the Qb test at follow-up as compared to baseline.

3. Functional connectivity measurements as statistically significant predictors of treatment response as defined by a data-driven approach. [Time Frame: In the month 8-9 following the last scan.]

Treatment response is defined as in outcome 3.

Eligibility Criteria

Go to ▼

Information from the National Library of Medicine

Choosing to participate in a study is an important personal decision. Talk with your doctor and family members or friends about deciding to join a study. To learn more about this study, you or your doctor may contact the study research staff using the contacts provided below. For general information, [Learn About Clinical Studies](#).

Ages Eligible for Study: 18 Years to 45 Years (Adult)
Sexes Eligible for Study: Male
Accepts Healthy Volunteers: No

Criteria

Inclusion Criteria:

- males
- aged 18-45 years old
- intelligent quotient (IQ) > 70 (as measured by WASI)
- diagnosis of ADHD confirmed through clinical assessment (Adult ADHD Clinic)
- non-medicated (stimulant medication-naive or not taking stimulant medication for at least 4 weeks)

Exclusion Criteria:

- no other brain disorders other than ADHD
- no condition precluding MRI scanning (e.g., metallic implants, claustrophobia)

Contacts and Locations

Go to ▼

Information from the National Library of Medicine

To learn more about this study, you or your doctor may contact the study research staff using the contact information provided by the sponsor.

*Please refer to this study by its [ClinicalTrials.gov](#) identifier (NCT number): **NCT03709940***

Locations

United Kingdom

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Sponsors and Collaborators

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Investigators

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More Information

Go to ▼

Responsible Party: King's College London
ClinicalTrials.gov Identifier: [NCT03709940](#) [History of Changes](#)
Other Study ID Numbers: ConnectADHD
First Posted: October 17, 2018 [Key Record Dates](#)
Last Update Posted: October 17, 2018
Last Verified: October 2018

Individual Participant Data (IPD) Sharing Statement:

Plan to Share IPD: No

Studies a U.S. FDA-regulated Drug Product: No

Studies a U.S. FDA-regulated Device Product: No

Product Manufactured in and Exported from the U.S.: No

Keywords provided by King's College London:

longitudinal study	treatment response
magnetic resonance imaging (MRI)	methylphenidate
brain connectivity	stimulant medication
biomarker	

Additional relevant MeSH terms:

Disease	Signs and Symptoms
Attention Deficit Disorder with Hyperactivity	Methylphenidate
Hyperkinesia	Central Nervous System Stimulants
Pathologic Processes	Physiological Effects of Drugs
Attention Deficit and Disruptive Behavior Disorders	Dopamine Uptake Inhibitors
Neurodevelopmental Disorders	Neurotransmitter Uptake Inhibitors
Mental Disorders	Membrane Transport Modulators
Dyskinesias	Molecular Mechanisms of Pharmacological Action
Neurologic Manifestations	Dopamine Agents
Nervous System Diseases	Neurotransmitter Agents