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Acute serotonergic modulation of brain regions and behaviors implicated in mood regulation

Submission date	Recruitment status
05/12/2019	No longer recruiting
Registration date	**Overall study status**
10/03/2020	Completed
Last Edited	**Condition category**
10/03/2020	Mental and Behavioural Disorders

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[X] Results
[ ] Individual participant data

Plain English summary of protocol

Background and study aims
Selective serotonin reuptake inhibitors (SSRIs) are considered first-line treatment in depression. However, the exact mechanism of this drug is still not fully understood today. The aim of this study is to investigate the effect of a single oral dose of SSRIs on brain and behavior and compare it to placebo (dummy drug) in healthy volunteers.

Who can participate?
Female and male healthy volunteers between 20 and 30 years of age

What does the study involve?
All participants receive a single oral dose of the SSRI escitalopram and placebo. One group receives escitalopram first and then undergoes a magnetic resonance imaging (MRI) scan 3-4 hours later. After a wash-out period of 8 weeks, this group of participants receives a placebo pill and then again undergoes MRI. A second group starts with the placebo pill and then, after 8 weeks, receives escitalopram. Neither the participants nor the experimenter will know if the participants receive the escitalopram or the placebo pill. Only after the study has finished will the experimenter learn the treatment orders. Before each MRI scan session, participants fill out questionnaires assessing depression and mood.

What are the possible benefits and risks of participating?
Participants receive financial compensation for taking part in the study. A single oral dose of SSRI rarely has minimal temporary side effects, such as nausea, changes in sleep, less sexual arousal, restlessnees, or headaches. MRI scanning does not have harmful effects, only rarely may participants experience circulatory problems.

Where is the study run from?
Max Planck Institute for Human Cognitive and Brain Sciences (Germany)

When is the study starting and how long is it expected to run for?
October 2011 to April 2013

Who is funding the study?
Max Planck Institute for Human Cognitive and Brain Sciences (Germany)

Who is the main contact?
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Contact information

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Scientific

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Additional identifiers

Clinical Trials Information System (CTIS)
2019-003470-12

Protocol serial number
NRO-080

Study information

Scientific Title
Acute serotonergic modulation of intrinsic functional connectivity and function in brain regions and behaviors implicated in mood regulation - a pharmacological fMRI study in healthy volunteers

Acronym
SEROTONIN

Study objectives
Hypothesis 1: It is hypothesized that an acute serotonergic challenge has a large-scale impact on the intrinsic functional connectivity of most cortical and subcortical areas and is not limited to specific networks.

Hypothesis 2: It is hypothesized that an acute serotonergic challenge alters BOLD response in main areas of the reward system and explore, whether these early alterations affect only responses to punishment or responses to both reward and punishment.

Hypothesis 3: It is hypothesized that an acute serotonergic challenge alters BOLD response in amygdala and explore, whether this affects cognitive performance and emotional distraction.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 11/10/2010, Ethikkommission an der Medizinischen Fakultät der Universität Leipzig (ethics board of the Medical Faculty of the University of Leipzig, Käthe-Kollwitz-Straße 82, 04109 Leipzig, Germany; Tel: +49 (0)341/97 154 90; Email: ethik@medizin.uni-leipzig.de), ref: 246-2009-09112009

Study design
Single-centre double-blind placebo-controlled crossover study

Primary study design
Interventional

Study type(s)
Other

Health condition(s) or problem(s) studied
Effects of the antidepressant escitalopram in healthy volunteers

Interventions
The researchers administer a single oral dose of 20 mg escitalopram, a selective serotonin reuptake inhibitor (SSRI), or placebo to healthy participants in a double-blind, placebo-controlled, crossover design. Two treatment orders are randomly assigned to participants to ensure complete balancing of treatments. Escitalopram or placebo are administered at two different test days separated by a wash-out period of 8 weeks. At the first test day, participants undergo a baseline MRI scan before initial drug administration. For the drug MRI scans, the researchers measure participants 3-4 hours after drug administration, during peak concentration of escitalopram in blood. Scanning time is approx. 60 minutes per scan, consisting of structural MRI, resting state fMRI, and functional MRI (cognitive load task and reward task). Before each

scan session, participants fill out questionnaires assessing depression (Hamilton Rating Scale for Depression) and mood (Profile of Mood states, and MOODS spectrum self-report).

Intervention Type
Drug

Phase
Not Applicable

Drug/device/biological/vaccine name(s)
Escitalopram

Primary outcome(s)
Structural, functional, and resting-state MRI data measured during baseline, placebo, and drug sessions

Key secondary outcome(s))
1. Reward and punishment processing measured using a monetary reward task, which participants perform during the functional MRI scans at baseline, placebo, and drug sessions
2. Cognitive performance measured using a cognitive load task, which participants perform during the functional MRI scans at baseline, placebo, and drug sessions

Completion date
31/12/2018

Eligibility

Key inclusion criteria
1. 20-30 years of age
2. Naive to antidepressants

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
24

Key exclusion criteria
1. Current or past psychiatric diagnosis as assessed with SKID-I and SKID-II interview
2. Major head trauma or neurological disease, current or in history
3. Use of psychotropic medication or of recreational drugs

4. MRI contraindications such as metal implants, claustrophobia, pregnancy
5. Smoking
6. Irregular sleep/wake rhythm (e.g., regular nightshifts or cross timeline travel)

Date of first enrolment
01/11/2011

Date of final enrolment
30/04/2013

Locations

Countries of recruitment
Germany

Study participating centre
Max Planck Institute for Human Cognitive and Brain Sciences
Stephanstrasse 1A
Leipzig
Germany
04103

Sponsor information

Organisation
Max Planck Institute for Human Cognitive and Brain Sciences

Funder(s)

Funder type
Research organisation

Funder Name
Max-Planck-Institut für Kognitions- und Neurowissenschaften

Alternative Name(s)
Max Planck Institute for Human Cognitive and Brain Sciences, MPI for Human Cognitive and Brain Sciences

Funding Body Type
Private sector organisation

Funding Body Subtype
Other non-profit organizations

Location
Germany

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be stored in a repository
Type of data: Statistic maps of functional connectivity analysis
Repository name: Neurovault.org
Weblink: https://identifiers.org/neurovault.collection:190
Process for requesting access: freely available
Consent from participants: Participants gave their consent that the results of this study will be published for scientific purposes.
Data anonymization: pseudonymised

IPD sharing plan summary
Stored in repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	06/10/2014	16/12/2019	Yes	No