Role of dopamine in flexible behaviour

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• Identify regional specificity of dopaminergic drug effects, i.e. the distinct behavioural roles of dopamine in the striatum and dopamine in the prefrontal cortex.• Identify receptor specificity of dopaminergic drug effects, i.e. the distinct...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Psychiatric disorders NEC
Study type	Interventional

Summary

ID

NL-OMON31967

Source
ToetsingOnline

Brief title
Dopamine and brain function

Condition

- Psychiatric disorders NEC

Synonym
cognitieve inflexibiliteit, mentale rigiditeit

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Sint Radboud
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Cognitive control, Dopamine, Flexibility, Functional MRI

Outcome measures

Primary outcome

• Functional Magnetic Resonance Imaging (fMRI)

• Behavioral performance on computerized tasks

• Blood plasma levels of prolactin and drug

• Self-report questionnaires

• Psychophysiological recordings (electrodermal activity, blood pressure, heart

rate)

Secondary outcome

not applicable

Study description

Background summary

The ability to adapt flexibly to our constantly changing environment requires cognitive and motivational control processes. These control processes implicate the brain substance dopamine. A variety of neuropsychiatric disorders, characterized by maladaptive behaviour, are treated with dopamine-enhancing drugs. However, there is large individual variation in dopaminergic drug efficacy. In addition, dopaminergic drugs can have contrasting effects across different task demands, so that some task benefit while other tasks are impaired by the same dopaminergic drug. The present project consists of four experiments in which we investigate the mechanisms underlying this large variability in dopaminergic drug efficacy. this work is essential for the understanding of the neurobiological of adaptive behaviour, but also for the development of pharmacotherapy that is targeted at specific behavioural deficits as well as at specific individuals.

Study objective

• Identify regional specificity of dopaminergic drug effects, i.e. the distinct behavioural roles of dopamine in the striatum and dopamine in the prefrontal cortex.

• Identify receptor specificity of dopaminergic drug effects, i.e. the distinct behavioural roles of dopaminergic activity at D1 family receptors and at D2 family receptors
• Identify neurobiological and genetic basis of individual variability in dopaminergic drug effects

Study design

Each subject will be tested in a cross-over design which consists of two or four visits. On each visit the subject is administered a single dose of bromocriptine (1.25mg), sulpiride (400mg) and/or placebo. Approximately 2 hours after administration, subjects will enter the fMRI scanner for 1 hour, to visualize region- and task-specific brain activity. After scanning, they will complete a relatively standard neuropsychological test battery.

Intervention

Subjects will be administered the following oral capsules for intake, each on a different visit: 1.25mg bromocriptine, 400mg sulpiride, 100mg levodopa + 25mg carbidopa and placebo.

Study burden and risks

Participation is without health risk. The burden on subjects consists of time-investment (max 21 hours spread over 4 visits) and the possible discomfort of self-report questionnaires, blood sampling, capsule intake, drug-induced but transient nausea, noise and claustrophobia of MRI scans, restrictions of diet, alcohol or other drug-intake prior to the test session.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Healthy volunteers between 18 and 45 years of age
Right-handed

Exclusion criteria

Metal objects in or around the body
Claustrophobia
(History of) psychiatric, neurological, endocrine disease or treatment
(History of) heart-related disease
Regular intake of drugs of abuse

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Randomized controlled trial
Masking:	Double blinded (masking used)
Control:	Placebo
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	01-12-2008
Enrollment:	192
Type:	Actual

Ethics review

Approved WMO

Application type:	First submission
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	NL21678.091.08