The Neurobiological Basis of Disengagement: A Mechanism Implicated in Visuospatial Attention.

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Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON34082

Source
ToetsingOnline

Brief title
The Neurobiology of Disengagement

Condition

- Other condition

Synonym
Neurobiology of (visuospatial) attention

Health condition

Geen aandoening; geneesmiddel wordt gebruikt om selectief een aandachtssysteem te inhiberen dmv cholinergisch agonisme

Research involving
Human

Sponsors and support

Primary sponsor: Universiteit Utrecht
Source(s) of monetary or material Support: NWO Open competitie MAGW (Maatschappij- en Gedragswetenschappen)

Intervention

Keyword: attention, erp, neurobiology, pharmacology

Outcome measures

Primary outcome

Behavioural measures:

In the VSC (Visual Spatial Cueing) paradigm: the validity effect in ms (RT valid cued target - RT invalid cued target).

A larger validity effect reflects either more bias, or less disengagement.

In the stop task paradigm, the time needed (in milliseconds) to abort a prepotent response: the Stop Signal Reaction Time (SSRT); SSRT reflects inhibition and related disengagement but is also dependent on bias.

Neurophysiological (Event Related Potentials, task related brain activity) endparameters in the VSC:

1) Parietal cue Event Related Potential (ERP) components.

These are the Anterior Directing Attention Negativity (ADAN) and the Late

Directing Attention Positivity (LDAP). Both are related to bias.

2) P1 ERP (following a validly cued target); associated with bias.

3) Late Positive Deflection (LPD) ERP (following an invalidly cued target);

associated with disengagement.

Neurophysiological (ERP) endparameters in the stop task:

1) N2 ERP (following the onset of a stopsignal), associated with disengagement.

2) LPD ERP (following the onset of a stopsignal), associated with

disengagement.

Secondary outcome

Dependent variables are identical to the primary parameters. The independent

variable is a subject variable: smoker/non-smoker. (See protocol for details).

Study description

Background summary

For the development of better pharmacological treatment of various pathologies in which attention and impulsivity
are implicated, such as ADHD, it is crucial to gain knowledge about the neurobiological basis.
Two neurobiological mechanisms are implicated in visuospatial attention, bias and disengagement. bias refers to
increased sensory information processing due to the orientation of attention. Disengagement refers to the

interruption of that attentional set, making processing of non attended stimuli possible. The dominant theory
posits that bias rests on cholinergic functioning and disengagement depends on noradrenergic functioning.
Results of pharmacological research are inconsistent and suggest the opposite.
In this research, the cholinergic part of an
alternative model which states the opposite of the dominant model but accounts beter for pharmacological results is
proposed and evaluated.

Study objective

Our primary objective is to provide a model which accounts for the inconsistencies in the pharmacological literature regarding the role of the noradrenergic and cholinergic system in visuo-spatial attention. Recently we started a University Medical Center (UMC) Utrecht METC approved study aimed at testing the noradrenergic part of the model using Clonidine. In the current study, our aim is to test the second - cholinergic - part of this model. Our secondary objective is to explore possible differences between smokers and non-smokers. It could be possible that nicotine abstinent smokers show less disengagement related activity as opposed to non-smokers due to either long-term effects of nicotine, or due to a possible inherent disengagement related deficit.

Study design

A single blind placebo-controlled crossover design will be used in which the order of the drug conditions (placebo, nicotine) and computer tasks (VSC, SST) will be counterbalanced across participants.

Intervention

Nicorette Freshmint 2mg will be used for manipulating (facilitating) the cholinergic system.

Study burden and risks

Participants have to fill out a questionnaire twice, the Profile Of Mood States (POMS). This will take in total approximately 10 minutes.
Participants will perform on two computer tasks with a total duration of approximately 110 minutes, while EEG is recorded.
EEG is a non-invasive method, but some electrode gel (salt solution) will be applied between the scalp and electrodes which participants
may wash out after the experiment at location. No significant side effects are expected for the administered dose of Nicorette Freshmint 2mg.

To conclude, to our opinion the importance of the proposed research outweighs the minimal burden and risks for participants, which is why we believe the research to be justified.

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

participants must be male and between 18-40 years old.

Exclusion criteria

- Hypersensitivity to nicotine or other substances in the chewing-gum

- oral infection or pharyngitis
- active oesophagitis
- (history of) cardiovascular disease
- liver failure / insufficiency
- Kidney failure / insufficiency
- Diabetes mellitus
- Use of medication

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Masking:	Single blinded (masking used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	18-03-2011
Enrollment:	32
Type:	Actual

Medical products/devices used

Product type:	Medicine
Brand name:	Nicorette Freshmint 2mg
Generic name:	NICOTINERESINAAT
Registration:	Yes - NL outside intended use

Ethics review

Approved WMO

Date:	20-07-2010

Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	27-09-2010
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	13-12-2011
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)

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
EudraCT	EUCTR2010-021222-35-NL
CCMO	NL32831.041.10