The role of Noradrenaline, Acetylcholine and NMDA in conscious perception

Published: 23-07-2018
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The objective of this study is to investigate the effects of stimulation of noradrenaline and acetylcholine and the blockade of NMDA-receptors on neural and behavioral measures of perception and consciousness.

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON48993

Source
ToetsingOnline

Brief title
NA, ACh, NMDA, and conscious perception

Condition

- Other condition

Synonym
Not applicable

Health condition

Geen aandoening, dit onderzoek richt zich op de werking van het gezonde brein.

Research involving
Human

Sponsors and support

Primary sponsor: Universiteit van Amsterdam
Source(s) of monetary or material Support: ERC-beurs

Intervention

Keyword: Consciousness, Neuromodulation, Neuroscience, Recurrent processing

Outcome measures

Primary outcome

Primary study parameters include behavioral reaction times and performance

scores and EEG-, MEG- and fMRI-measures.

Secondary outcome

Not applicable

Study description

Background summary

Fluctuations in global brain state, modulated by noradrenaline and acetylcholine, possibly affect conscious perception. In addition, evidence suggests that recurrent processing, which is thought to be crucial for conscious perception, is dependent on NMDA-receptor activity. In the proposed study we aim to provide causal evidence for the roles of these neurobiological factors in conscious perception.

Study objective

The objective of this study is to investigate the effects of stimulation of noradrenaline and acetylcholine and the blockade of NMDA-receptors on neural and behavioral measures of perception and consciousness.

Study design

This study will use a within-subject, double-blind, placebo-controlled randomized crossover design.

Intervention

Participants will receive 40mg atomoxetine, 5mg donepezil, 20mg memantine or placebo on four different test sessions, in a randomized order.

Study burden and risks

Participants will have to visit the lab 3 to 5 times, depending on the specific study part in which they participate. One of these visits is the initial intake session, the others are testing days. On these testing days, participants will perform simple computer tasks, while their brain activity is measured with EEG, MEG or fMRI. In addition, participants will receive 40mg atomoxetine, 5mg donepezil, 20mg memantine or placebo on each testing day. Before and after testing days, participants have to adhere to some simple restrictions concerning the intake of alcohol, drugs and caffeïne and operating motorized vehicles.

De used products can cause side-effects, including dizziness, nausea and headaches. Previous studies using single doses of these products show, however, that they are well-tolerated. Considering the extensive exclusion criteria, screening procedure, constant monitoring of participants and the fact that they only receive single, subtherapeutic doses of these products, we do not expect any serious side-effects.

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 30 years old;
Native Dutch speakers;
Predominant right-handedness;
BMI between 18.5 and 30.
Male

Exclusion criteria

Current or history of any medical or psychiatric disorder or disease
Smoking
Allergy for atomoxetine, donepezil, memantine or one of the inactive ingredients of these products

Study design

Design

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

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	24-05-2019
Enrollment:	210

Type:	Actual

Ethics review

Approved WMO Date:	23-07-2018
Application type:	First submission
Review commission:	METC Amsterdam UMC
Approved WMO Date:	11-03-2019
Application type:	Amendment
Review commission:	METC Amsterdam UMC
Approved WMO Date:	03-07-2019
Application type:	Amendment
Review commission:	METC Amsterdam UMC
Approved WMO Date:	12-11-2019
Application type:	Amendment
Review commission:	METC Amsterdam UMC
Approved WMO Date:	17-06-2020
Application type:	Amendment
Review commission:	METC Amsterdam UMC
Approved WMO Date:	16-07-2020
Application type:	Amendment
Review commission:	METC Amsterdam UMC

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	NL64341.018.18