Causal test of right anterolateral prefrontal cortex (ralPFC) involvement in fear and response inhibition.

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To investigate the causal involvement of the ralPFC in the offset of fear (study 1) and SSRT (study 2) by temporally inhibiting this area using transcranial magnetic stimulation (TMS).

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Anxiety disorders and symptoms
Study type	Interventional

Summary

ID

NL-OMON45731

Source
ToetsingOnline

Brief title
Right anterolateral prefrontal cortex, fear and response inhibition.

Condition

- Anxiety disorders and symptoms

Synonym
anxiety disorder, fear regulation

Research involving
Human

Sponsors and support

Primary sponsor: Universiteit Utrecht
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Fear, Response inhibition, Transcranial Magnetic Stimulation (TMS)

Outcome measures

Primary outcome

The main study parameter for study 1 is the effect of TMS stimulation on the reduction in FPS at offset of a threat cue, for study 2 the increase in SSRT (behaviourally) and concomitant decrease of N1 (derived from the EEG).

Secondary outcome

N/A.

Study description

Background summary

Previous research has indicated that offset of a threat cue is associated with rapid decrement of fear as indexed by fear-potentiated startle (FPS). With functional magnetic resonance imaging (fMRI), corresponding activation of an area of the right anterolateral prefrontal cortex (ralPFC) was demonstrated. This protocol investigates whether activity in this area is necessary for the fast inhibition of an ongoing fear reaction (study 1; N = 28). If findings from study 1 support the involvement of the ralPFC in inhibition of fear, a subsequent study will be performed to investigate whether activity in the ralPFC is also necessary for inhibition of behaviour as observed in the stop signal reaction time task (SSRT, study 2; N = 28). This allows to investigate the extent to which inhibition of fear may be related to inhibition of behaviour. However, if study 1 does not provide support for involvement of the ralPFC in inhibition of fear, this rationale for study 2 would not hold. In that case, study 2 will be reconsidered and the METC will be consulted again.

Study objective

To investigate the causal involvement of the ralPFC in the offset of fear (study 1) and SSRT (study 2) by temporally inhibiting this area using transcranial magnetic stimulation (TMS).

Study design

Single-blind cross-over intervention with active and control sites.

Intervention

Participants visit the laboratory on two separate days, and receive 40 sec. slow-repetitive TMS stimulation at 70% of the motor threshold to the right side of their forehead on one of the days, and control stimulation on the other day.

Study burden and risks

The burden consists of participating in two test days that take approximately 2 hours each, undergoing TMS stimulation and the fear-potentiated startle test (study 1) and SSRT with EEG measurements (study 2). All research procedures are well-validated and with careful screening of subjects for TMS exclusion criteria represents a very minimal risk. The stimulation combined with the tasks and measurements consists of a moderate burden for research participants. Participants are adult, mentally able healthy volunteers who give informed consent and are compensated for their time investment.

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

- Age between 18 and 45.
- Right-handedness.
- Written informed consent.

Exclusion criteria

Violation of standard TMS safety criteria (Rossi, Hallett, Rossini, & Pascual-Leone, 2009; see also Appendix F1.1: TMS screenings questionnaire):
- Incapability of giving an informed consent
- Ferrous objects in or around the head (e.g. braces, pacemaker, metal fragments)
- History of closed- or open-head injury
- History of epilepsy
- History of epilepsy in first-degree relatives
- History of neurological or psychiatric illness
- Major medical history
- Drug or alcohol abuse over a period of six months prior to the experiment
- Pregnancy

Study design

Design

Study type: Interventional

Masking:	Single blinded (masking used)
Control:	Uncontrolled
Primary purpose:	Other

Recruitment

NL

Recruitment status:	Recruiting

Start date (anticipated):	18-10-2017
Enrollment:	56
Type:	Actual

Medical products/devices used

Generic name:	TMS
Registration:	Yes - CE intended use

Ethics review

Approved WMO Date:	03-04-2017
Application type:	First submission
Review commission:	METC NedMec
Approved WMO Date:	25-08-2017
Application type:	Amendment
Review commission:	METC NedMec
Approved WMO Date:	15-08-2018
Application type:	Amendment
Review commission:	METC NedMec
Approved WMO Date:	31-12-2021
Application type:	Amendment
Review commission:	METC NedMec

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	NL60815.041.17