The role of the right inferior frontal gyrus braking system in gambling: a transcranial direct current stimulation study

Published: 14-11-2016
Last updated: 14-04-2024

To investigate the effects of anodal and cathodal tDCS on gambling compared to sham stimulation. Additionally, changes in EEG activity will be explored.

Ethical review	Approved WMO
Status	Will not start
Health condition type	Other condition
Study type	Interventional

Summary

ID

NL-OMON43045

Source
ToetsingOnline

Brief title
rIFG tDCS and gambling

Condition

- Other condition

Synonym
niet van toepassing

Health condition

Niet van toepassing - onderzoek bij gezonde vrijwilligers

Research involving
Human

Sponsors and support

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

Intervention

Keyword: gambling, inferior frontal gyrus, theta oscillations, transcranial direct current stimulation

Outcome measures

Primary outcome

TDCS induced changes in gambling as measured by the *certainty equivalent*.

Secondary outcome

TDCS-induced changes in EEG resting state activity.

Study description

Background summary

Imaging, lesion and non-invase brain stimulation studies have shown the importance of the right inferior frontal gyrus (rIFG) in response inhibition. Recently, imaging studies have suggested that this *braking* mechanisms might also be involved in gambling. Here, we further explore this idea. The goal is to provide direct evidence for the involvement of rIFG in gambling by applying anodal and cathodal transcranial direct current stimulation (tDCS) during a gambling task.

Study objective

To investigate the effects of anodal and cathodal tDCS on gambling compared to sham stimulation. Additionally, changes in EEG activity will be explored.

Study design

Placebo (sham) controlled double-blind within subjects design.

Intervention

Online transcranial direct current stimulation (tDCS) will be delivered by a

battery-driven electric current stimulator (Eldith DC Stimulator (CE 0118), Ilmenau) using two of electrodes, one over rIFG and the other over the contralateral supra-orbital region (5x7 cm each). Anodal and cathodal tDCS will be applied at an intensity of 1.5 mA (current density for each electrode: 0.043 mA/cm^2). These conditions will be compared to a placebo condition in which sham tDCS is applied.

Study burden and risks

The currently proposed tDCS procedure and experiment does not carry any significant risks. Stimulation will be performed in line with the Standard Operating Procedure Non-Invasive Brain Stimulation of the Donders Institute for Brain, Cognition and Behaviour. Potential side-effects of tDCS are perception of light tingling, itching or burning sensations on the under the electrodes, light headache and/or fatigue. These are mild discomforts that respond promptly to common analgesics. Volunteers can withdraw from the study at any given time and there are no direct benefits for the participants. The novel insights will broaden our understanding of mechanisms of gambling in the brain.

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

Between 18-35 years of age years; Right-handed; Non-smoking; Normal or corrected-to-normal vision; Willingness and ability to give written informed consent and willingness and ability to understand the nature and content, to participate and to comply with the study requirements.

Exclusion criteria

(1) Average use of more than 3 alcoholic beverages daily; (2) Use of psychotropic medication or recreational drugs; (3) Skin disease; (4) Pregnancy; (5) Serious head trauma or brain surgery; (6) Neurological or psychiatric disorders; (7) Large or ferromagnetic metal parts in the head (except for a dental wire); (8) Implanted cardiac pacemaker or neurostimulator; (9) Participation in a NBS study in the past 28 days; (10) Previous participation in 10 or more NBS studies.

Study design

Design

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

Recruitment

NL
Recruitment status:	Will not start
Enrollment:	30

Type:	Anticipated

Ethics review

Approved WMO Date:	14-11-2016
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	NL59220.091.16