Metabolic effects of Deep Brain Stimulation in patients with Obsessive Compulsive Disorder.

Published: 06-02-2009
Last updated: 06-05-2024

1.To relate activity of the HPA axis to OCD symptoms and prefrontal brain abnormalities, using plasma ACTH and urine cortisol measures.2. To examine the role of nucleus accumbens activity on changes in endogenous glucose production, energy…

Ethical review	Approved WMO
Status	Pending
Health condition type	Glucose metabolism disorders (incl diabetes mellitus)
Study type	Observational invasive

Summary

ID

NL-OMON33826

Source
ToetsingOnline

Brief title
Metabolic effects of DBS in OCD.

Condition

- Glucose metabolism disorders (incl diabetes mellitus)
- Glucose metabolism disorders (incl diabetes mellitus)

Synonym
Obsessive Compulsive Disorder (OCD); compulsive behaviour

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Medisch Centrum
Source(s) of monetary or material Support: NWO

Intervention

Keyword: Deep brain stimulation, glucose metabolism, HPA-axis, Obsessive compulsive disorder

Outcome measures

Primary outcome

Plasma ACTH and cortisol.

Cortisol in 24-h urine.

Hepatic glucose production.

Resting Energy expenditure (REE).

Plasma lipids.

Secondary outcome

Alterations in cerebral perfusion (fMRI activity)

Dopaminergic changes (SPECT D2 receptor binding).

OCD symptom severity (YBOCS) and neuropsychological performance.

Study description

Background summary

Deep Brain Stimulation (DBS) is a promising intervention for treatment-intractable Obsessive Compulsive Disorder (OCD) patients. Currently, at the AMC Amsterdam, the efficacy of deep brain stimulation (DBS) for treatment refractory OCD patients targeting the nucleus accumbens is under investigation in 16 patients. See METC protocol number 04/113-E. In the current study, we aim to examine the hormonal and metabolic effects of DBS at the nucleus accumbens target in the same set of 16 OCD patients.

Previous studies have suggested increased activity of the HPA axis in OCD, with indications of a disturbed functioning at cerebral level. Increasing evidence points to a relation between the prefrontale cortex (PFC) and the HPA axis.

Dysfunction of the prefrontal cortex, as part of the frontal-striato-thalamic circuitry, is important in the pathophysiology of OCD. DBS in the nucleus accumbens may provide an extraordinary paradigm for examining the role of HPA activity and PFC involvement in OCD.
Recently it has been shown that hypothalamic activity is altered in obese subjects with type 2 diabetes mellitus compared to healthy controls. Moreover, result from our own study suggested that disturbances in dopamine metabolism within the brain might be related to disturbed hepatic glucose metabolism.
Since food intake, satiety and energy expenditure are the major players in the regulation of body weight, it is not very surprising that quite recently the nucleus accumbens has become a new area of interest in obesity research.
Dopamine is one of the main neurotransmitters of the nucleus accumbens and is involved in food intake, satiety and energy expenditure. It has been shown that dopamine metabolism in the mesoaccumbens system may be altered in obesity with contradictory results showing either reduced or increased dopamine signaling.
The procedure of DBS in the nucleus accumbens provides an exceptional opportunity to gain insight in the role of the nucleus accumbens in hepatic glucose production, energy expenditure and plasma lipids.

Study objective

1.To relate activity of the HPA axis to OCD symptoms and prefrontal brain abnormalities, using plasma ACTH and urine cortisol measures.
2. To examine the role of nucleus accumbens activity on changes in endogenous glucose production, energy expenditure and plasma lipids following nucleus accumbens DBS.

Study design

A total of 16 subjects will be invited to participate in this study, which is determined by the amount of subjects that are included in our current DBS trial.
HPA-axis activity will be determined by measuring plasma ACTH and cortisol in two consecutive 24-h urine samples . Endogenous glucose production will be measured via a hyperinsulinemic euglycemic clamp using stable isotopes.
Furthermore, energy expenditure and plasma lipids will be assessed in on and off conditions of the stimulator.
Differences in symptoms strength and neuropsychological performance will be assessed with the Yale Brown Obsessive Compulsive Scale (YBOCS) and with tests taken from the Cambridge Neuropsychological Test Automated Battery (CANTAB).
Neuroimaging will be performed using fMRI and SPECT, according to protocol MEC 07/330

Study burden and risks

The inserted infusion needle can cause bruises.
The overall risks are very small, the main burden is that it is time consuming.

The group of subjects we would like to include is unique, because worldwide there are very few people that have received a neurostimulator. Insight in how this intervention works can also provide insight in the pathofysiology and treatment possibilities of OCD.

Contacts

Public
Academisch Medisch Centrum

Meibergdreef 9
1105 AZ, Amsterdam
Nederland
Scientific
Academisch Medisch Centrum

Meibergdreef 9
1105 AZ, Amsterdam
Nederland

Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

- Subjects have signed informed consent.
- Fulfilling in- and exclusion criteria according METC protocol number 07/330.

Exclusion criteria

- Use of psychotropic drugs
- Use of drugs of abuse
- Pregnancy
- Use of medication known to interfere with glucose or lipid metabolism.
- Diabetes mellitus type 2 or impaired fasting glucose.
- Primary lipid disorder.
- Performance of vigorous exercise.
- Renal insufficiency or elevated liver enzymes (>2.5x above reference range).

Study design

Design

Study type: Observational invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	01-11-2008
Enrollment:	16
Type:	Anticipated

Ethics review

Approved WMO

Application type:	First submission
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	NL25059.018.08