Validation of novel PET tracer [11C]-GMOM: Assessment of dosimetry, biodistribution, and specific binding in healthy volunteers

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The objective of this project is to assess the applicability of [11C]GMOM for in vivo imaging of the NMDA receptor.

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

Summary

ID

NL-OMON39348

Source
ToetsingOnline

Brief title
Validation of novel PET tracer [11C]-GMOM

Condition

- Other condition
- Neurological disorders NEC
- Schizophrenia and other psychotic disorders

Synonym
NMDA receptor function (not a specific disease)

Health condition

onderzoek heeft in de toekomst betrekking op bovenstaande aandoeningen, maar wordt uitgevoerd bij gezonde controles

Research involving
Human

Sponsors and support

Primary sponsor: Vrije Universiteit Medisch Centrum
Source(s) of monetary or material Support: CTMM LeARN

Intervention

Keyword: dosimetry, NMDA receptor, positron emission tomography

Outcome measures

Primary outcome

Primary objectives:

i) To examine the regional brain uptake and its metabolites of [11C]GMOM in

healthy volunteers.

ii) To examine the specific binding potential of [11C]GMOM in the brain in

healthy volunteers before and after ketamine displacement

iii) To assess the whole body biodistribution and to determine the dosimetry of

[11C]GMOM in healthy volunteers.

Secondary outcome

not applicable

Study description

Background summary

Alterations in NMDA receptor function have been implicated in the pathophysiology of several neurological and neuropsychiatric disorders, such as schizophrenia and Alzheimer*s disease. In vivo imaging of the NMDA receptor would be a valuable tool to assess the role of NMDA receptor availability in the pathophysiology of neurological and neuropsychiatric disorders. [11C]GMOM has excellent preclinical characteristics for this purpose and is suitable for

evaluation in human subjects.

Study objective

The objective of this project is to assess the applicability of [11C]GMOM for in vivo imaging of the NMDA receptor.

Study design

This is an open study. The study consists of three substudies with three groups of healthy subjects according to the three objectives. Both men and women are allowed to participate in this study with the age range from 18 to 40 years old. The first group (N=4, regional brain uptake and metabolites substudy) will receive a dose of 370 Mega Becquerel (MBq) [11C]GMOM. If a signal in the brain can be identified, the specific binding of [11C]GMOM in the brain will be assessed in a second group of healthy volunteers (N=6) before and after intravenous administration of S-ketamine (0.3 mg/kg).
The final group (N=4, biodistribution and dosimetry substudy) will receive a standard dose of 370 MBq of [11C]GMOM to assess the whole body biodistribution and to determine the effective dose of [11C]GMOM.
However, since first the expiration time of [11C]GMOM will be assessed, the study will start with only three subjects from the first group. After scanning these participants, permission will be asked from the medical ethical committee of the VU University Medical Center to include more participants in the study (see protocol section 3).

Study burden and risks

The benefit of this study is its contribution to the development of a novel NMDA PET tracer. At present, there is no well validated NMDA receptor PET radioligand available. This would provide a powerful means to examine NMDA receptor aetiology in various patient groups with neurological and psychiatric diseases, such as Alzheimer*s disease and schizophrenia. In addition, a novel NMDA tracer will create the possibility for imaging-guided therapy. Furthermore, a novel PET radiotracer that can target the NMDA receptor can assess the mechanisms of drugs, which will be of high interest for the development of novel pharmaceuticals. Risks associated with participation in this study are related to radiation exposure, idiosyncratic reaction to the tracer, placement of intra-venous and arterial catheters, blood sampling, discomfort during scanning, and adverse events in response to ketamine administration (only group 2 will receive ketamine, see also protocol section 8.2.3 and protocol section 10.3).

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

- Men and women;
- Age between 18-40 years;
- Good physical health evaluated by medical history, physical (including neurological) examination and screening laboratory tests (Haemoglobin (Hb) must be 8 mmol \ litre at the time of the screening for males and 7 mmol \ litre for females);
- Weight 50 kg;
- Never mentally ill according to Research Diagnostic Criteria (RDC);
- A negative pregnancy test must be obtained for all females within 48 hours before starting the PET scan;- Normal MRI scan as evaluated by a neuroradiologist;
- Written informed consent of the subject;

Exclusion criteria

- (History of) Any psychiatric or neurological disorder (DSM-IV criteria);
- Coronary heart disease;
- (History of) Alcohol and/or drug abuse (DSM-IV criteria);
- Any clinical significant abnormality of any clinical laboratory test, including drug screening;
- Any condition that may interfere with MRI scanning, e.g. metal objects in or around the body or claustrophobia;
- Blood donation or substantial blood loss within 3 months before the PET scan;
- Intake of investigational medication within 30 days prior to the start of this study;
- Pregnancy;
- Smoking;

Study design

Design

Study type: Observational invasive

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

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	19-12-2012
Enrollment:	14
Type:	Actual

Medical products/devices used

Product type:	Medicine
Brand name:	[11C]GMOM
Generic name:	[11C]GMOM

Ethics review

Approved WMO Date:	29-05-2012
Application type:	First submission
Review commission:	METC Amsterdam UMC
Approved WMO Date:	30-08-2012
Application type:	First submission
Review commission:	METC Amsterdam UMC
Approved WMO Date:	18-02-2013
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
EudraCT	EUCTR2012-001521-27-NL
CCMO	NL37858.029.12