Cataplexy versus REM sleep atonia: a neurophysiological study

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Is the muscle weakness during cataplexy due to pre- or postsynaptic inhibition? In other words: what happens with the H-reflex and Magnetic Evoked Potential during REM sleep and cataplexy?

Ethical review	Approved WMO
Status	Will not start
Health condition type	Sleep disturbances (incl subtypes)
Study type	Observational non invasive

Summary

ID

NL-OMON30069

Source
ToetsingOnline

Brief title
Cataplexy vs REM sleep atonia

Condition

- Sleep disturbances (incl subtypes)

Synonym
Cataplexy, transient muscle weakness

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Medisch Centrum
Source(s) of monetary or material Support: VENI-subsidie van de Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO)

Intervention

Keyword: Cataplexy, postsynaptic inhibition, presynaptic inhibition, REM sleep atonia

Outcome measures

Primary outcome

Magnitude of the H-reflex and Magnetic Evoked Potential during REM sleep and

cataplexy compared to resting values.

Secondary outcome

None

Study description

Background summary

Narcolepsy is a disorder of the central nervous system, characterised by excessive daytime sleepiness and transient episodes of muscle weakness. These attacks are called 'cataplexy' and are induced by emotions. At the present, it is unclear what mechanism is responsible for these attacks. Treatment is therefore only available on empirical base.
The current theory is that cataplexy is equivalent to the paralysis every individual has during dreaming, the so-called REM sleep atonia. During this state, the neuron in the spinal cord, responsible for muscle tone, is temporarily inhibited.
Whether this is due to pre- or postsynaptic influences, is not known.

Study objective

Is the muscle weakness during cataplexy due to pre- or postsynaptic inhibition? In other words: what happens with the H-reflex and Magnetic Evoked Potential during REM sleep and cataplexy?

Study design

In an experimemtal setting, one of the nerves in the leg will be stimulated with an electrical current in order to measure the H-reflex. At the same time, a certain area of the brain that is responsible for movements of the legs, will be stimulated with a strong magnet. Both techniques will be performed during sleep in all subjects, in narcoleptic patients also during cataplexy. In this

way, data can be obtained about the excitability of the alpha motor neuron in the spinal cord.

Study burden and risks

Both techniques have been used worldwide for years and are safe. The burden for the subjects will be a disturbed sleep as awakening upon the magnetic stimulus is likely. Since the narcoleptics using medication must stop this during two weeks, they have the risk of the cataplexy getting worse. However, this is reversible as soon as the medication is restarted with no risk of permanent damage whatsoever.

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

Narcolepsy with cataplexy according to the International Classification of Sleep Disorders, 2005

Exclusion criteria

Structural brain damage, pregnancy, intracranial metal objects, pacemakers, history of epileptic insults and/or a first degree relative with epilepsy, other neurological or psychiatrical illness.

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Allocation:	Non-randomized controlled trial
Masking:	Open (masking not used)
Control:	Active
Primary purpose:	Basic science

Recruitment

NL

Recruitment status:	Will not start
Enrollment:	30
Type:	Anticipated

Ethics review

Approved WMO

Application type:	First submission
Review commission:	METC Leiden-Den Haag-Delft (Leiden) metc-ldd@lumc.nl

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	NL12138.058.06