The effect of caffeine on cognitive performance and brain activity following a ‘real life’ workday - an fMRI title.

Gepubliceerd: 13-02-2009 Laatst bijgewerkt: 15-05-2024

The stimulant effects of caffeine result in its common consumption by individuals in an attempt to combat the detrimental effects of fatigue on performance. However, inconsistent findings regarding the effects of caffeine on cognitive performance...

Ethische beoordeling	Positief advies
Status	Werving gestopt
Type aandoening	-
Onderzoekstype	Interventie onderzoek

Samenvatting

ID

NL-OMON20613

Bron
Nationaal Trial Register

Verkorte titel
caffeine and fMRI

Aandoening

Fatigue, caffeine, vermoeidheid, cafeine

Ondersteuning

Primaire sponsor: Universiteit Maastricht
Overige ondersteuning: Universiteit Maastricht

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

The main outcome measures are subjective fatigue and vitality ratings, neuropsychological performance (mean reaction time and accuracy) and the fMRI blood oxygen level dependent (BOLD) response during working memory and verbal learning tasks.

Toelichting onderzoek

Achtergrond van het onderzoek

This study aims to determine the effects of acute coffee consumption compared to consumption of decaffeinated coffee on subjective fatigue and vitality ratings, neuropsychological performance and brain activity during working memory and learning tasks. Acute effects will be investigated following a ‘real life’ workday during which caffeine was consumed according to the participant’s habitual regime.

Doel van het onderzoek

The stimulant effects of caffeine result in its common consumption by individuals in an attempt to combat the detrimental effects of fatigue on performance. However, inconsistent findings regarding the effects of caffeine on cognitive performance mean that the actions of caffeine on cognition are unclear. Further, very few studies have examined brain activity underlying caffeine induced behavioural effects. The present study will use functional magnetic resonance imaging (fMRI) to investigate the effects of acute caffeine consumption in the ‘real life’ context of habitual caffeine use on the brain activity of individuals fatigued by a ‘real life’ workday. Findings will shed light on the mechanisms whereby caffeine affects behaviour and alleviates fatigue.
The study also has a much broader research aim to investigate the use of fMRI as a more sensitive tool for the detection of the effects of nutritional interventions. Functional MRI has already been demonstrated to be a more sensitive method for the detection of subtle cognitive impairment following mild traumatic brain injury, multiple sclerosis, human immunodeficiency virus and chronic fatigue syndrome. The use of fMRI provided validation of cognitive complaints in these groups where assessment using neuropsychological tasks could not. Similarly, it is hoped that fMRI will be able to provide validation of the subjective fatigue alleviating effects of nutritional interventions by demonstrating cognitive task related changes in brain activation.

Onderzoeksopzet

1. Training session (fatigue assessment scale, need for recovery scale, neurovegetative scale, Dutch adult reading test);

2. 1st testing session (groningen sleep quality scale, karolinksa sleepiness scale, profile of mood state [fatigue and vitality subscales], NASA task load index, finger precueing task, short mackworth clock, letter-digit substitution test, stroop, Scanning tasks [sternberg working memory task, verbal learning task], saliva samples, blood glucose measurement);

3. 2nd testing session (1 week after 1st session: same tasks as 1st session).

Onderzoeksproduct en/of interventie

All participants will be tested twice: once after acute caffeinated coffee administration (100 mg caffeine, equivalent to 1 cup of coffee) and once after acute decaffeinated coffee administration (placebo).

Contactpersonen

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

Only right handed physically and mentally healthy volunteers will be included.

1. Male;

2. Moderate caffeine consumers;

3. School teachers.

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

The exclusion criteria are based on factors which are MRI contraindications or are known to affect neuropsychological task performance, brain activity, caffeine pharmacokinetics or the safety of caffeine consumption.
People who suffer from significant past or present physical or psychiatric illnesses (epilepsy, stroke, Parkinson's disease, MS, brain surgery, brain trauma, electroshock therapy, kidney dialysis, renal dysfunction, treatment by a neurologist or psychiatrist, diabetes, heart disease, migraine, Ménière's disease, hypertension, cardiac arrhythmias, heart palpitations, brain infections, chronic fatigue syndrome or burnout, impaired liver function, peptic ulcer disease),
who currently habitually consume nicotine at any time during weekdays (due to the effect of smoking on caffeine metabolism (Nehlig, 1999) or have drug or alcohol problems,
who receive medication at the moment of inclusion (in particular disulfiram, mexiletine, cimetidine, norfloxacin, enoxacin, ciprofloxacin, nonsteroidal anti-inflammatory drugs, aspirin, corticosteroids, phenylpropanolamine, monoamine oxidase inhibitors, antiarrhythmic agents and diazepam),
who have an MRI contraindication (brain surgery, pacemaker, metal objects/part in body, claustrophobia, large parts of the body tattooed)
or who are hypersensitive to caffeine, will be excluded from this study.

Onderzoeksopzet

Opzet

Type:	Interventie onderzoek
Onderzoeksmodel:	Cross-over
Toewijzing:	N.v.t. / één studie arm
Blindering:	Open / niet geblindeerd
Controle:	Placebo

Deelname

Nederland
Status: Werving gestopt
(Verwachte) startdatum: 01-04-2009

Aantal proefpersonen:	20
Type:	Werkelijke startdatum

Ethische beoordeling

Positief advies

Datum:	13-02-2009
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

ID: 35704
Bron: ToetsingOnline
Titel:

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL1591
NTR-old	NTR1671
CCMO	NL26036.068.08
ISRCTN	ISRCTN wordt niet meer aangevraagd
OMON	NL-OMON35704

Resultaten

Samenvatting resultaten
N/A