One night of partial sleep restriction: effects on metabolism, mood, and stress responsiveness

Gepubliceerd: 06-04-2016 Laatst bijgewerkt: 18-08-2022

We hypothesize that a single night of short sleep duration (4 hours), compared to normal sleep duration (8 hours) reduces metabolic flexibility, increases insulin resistance and thereby reduces HPA-reactivity. Furthermore, we hypothesize that a...

Ethische beoordeling	Positief advies
Status	Anders
Type aandoening	-
Onderzoekstype	Interventie onderzoek

Samenvatting

ID

NL-OMON25362

Bron
Nationaal Trial Register

Aandoening

Sleep; metabolism; mood; stress
Slaap; metabolisme; stemming; stress

Ondersteuning

Primaire sponsor: Leiden University Medical Center
Overige ondersteuning: The study is co-financed by Unilever.

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

- Metabolic flexibility; measured as change in RQ and lipid levels after a standard meal
- Stress responsiveness; measured as change in stress hormones, heart rate and blood

pressure after a mild physical stressor

Toelichting onderzoek

Achtergrond van het onderzoek

In modern daily life, incidental short sleep duration has become a common feature. Chronic short sleep duration is associated with a many adverse health effects, including metabolic disturbances such as obesity, type 2 diabetes and cardiovascular diseases, as well as disturbances in the stress system, negative mood and tissue ageing. These associations may be explained by metabolic disturbances caused by repeated incidental short sleep duration.

This study aims to investigate the effects of a single night of short sleep on metabolism, mood and stress responsiveness. To this end, we will include healthy participants in a cross-over intervention trial and subjects participants to both short and normal sleep.

Doel van het onderzoek

We hypothesize that a single night of short sleep duration (4 hours), compared to normal sleep duration (8 hours) reduces metabolic flexibility, increases insulin resistance and thereby reduces HPA-reactivity. Furthermore, we hypothesize that a single night of short sleep will negatively affect mood and tissue ageing due to dysregulation of HPA-axis. Since BMI is correlated with metabolic inflexibility and insulin resistance, we hypothesize that individuals with a higher BMI will show a more detrimental effect of short sleep on metabolism, HPA-axis reactivity and downstream effects on mood and tissue ageing, than individuals with a lower BMI.

Onderzoeksopzet

Outcome parameters will be measured on the day immediately following the sleep intervention.

Onderzoeksproduct en/of interventie

One night of short sleep (4h) will be compared to one night of normal sleep (8h).

Contactpersonen

Publiek

Albinusdreef 2 / 2333 ZA Leiden

Rosa van den Berg
Dept. of Medicine, Division of Endocrinology and Einthoven Laboratory for Experimental Vascular Medicine
Leiden University Medical Center

P.O.Box 9600

Leiden 2300 RC
The Netherlands
0031 (0) 71- 5268172

Wetenschappelijk

Albinusdreef 2 / 2333 ZA Leiden

Rosa van den Berg
Dept. of Medicine, Division of Endocrinology and Einthoven Laboratory for Experimental Vascular Medicine
Leiden University Medical Center

P.O.Box 9600

Leiden 2300 RC
The Netherlands
0031 (0) 71- 5268172

Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

- Informed consent

- Male Caucasian

- Age between 18 and 55 years

- BMI between 20 and 35 kg/m2

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

- Active endocrine disease (e.g. diabetes mellitus type 1 and type 2, thyroid disease, any signs of Cushing’s syndrome, adrenal disease and lipid-associated disorders such as FH)

- Fasting glucose >7.0 mmol/L

- Severe chronic disease (e.g. chronic liver or kidney disease)

- Severe insomnia, sleep disorders or exceptional habitual sleep duration (<6 or >10 h).

- Medication use including the following: lipid lowering drugs, glucocorticoids, sleep medication, hormone replacement, glucose lowering drugs, insulin therapy, antidepressants and psychotropic drugs (last 6 weeks)), anti-coagulants

- Recent time zone travel (last 6 weeks)

- Shift work (last 6 weeks)

- Severe alcohol use (>21 units/week)

- Psychiatric disease

- Drug abuse

- Recent participation to another nutritional or biomedical trial (last 6 weeks)

- Medication use which may interfere with study measurements, as judged by the responsible physician

- Reported weight loss or weight gain (10%) in the last six months prior to the pre-study screening

- Clinically relevant abnormalities in clinical chemistry at screening (to be judged by the study physician)

- Reported use of any nicotine containing products in the six months preceding the study and during the study itself;

- Extreme strenuous exercise during last 3 months, as judged by responsible physician

- Excessive sunbathing during last 3 months, as judged by responsible physician.

Onderzoeksopzet

Opzet

Type:	Interventie onderzoek
Onderzoeksmodel:	Cross-over
Toewijzing:	N.v.t. / één studie arm

Controle: N.v.t. / onbekend

Deelname

Nederland

Status:	Anders
(Verwachte) startdatum:	01-05-2016
Aantal proefpersonen:	36
Type:	Onbekend

Ethische beoordeling

Positief advies

Datum:	06-04-2016
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL5680
NTR-old	NTR5824
Ander register	ABR dossiernummer NL55111.058.15 : Protocol-ID P15.353

Resultaten

Samenvatting resultaten

Donga,E., van,D.M., van Dijk,J.G., Biermasz,N.R., Lammers,G.J., van Kralingen,K.W., Corssmit,E.P., and Romijn,J.A. (2010a). A single night of partial sleep deprivation induces insulin resistance in multiple metabolic pathways in healthy subjects. J Clin Endocrinol. Metab 95, 2963-2968.

Donga,E., van,D.M., van Dijk,J.G., Biermasz,N.R., Lammers,G.J., van,K.K., Hoogma,R.P., Corssmit,E.P., and Romijn,J.A. (2010b). Partial sleep restriction decreases insulin sensitivity in type 1 diabetes. Diabetes Care 33, 1573-1577.