The effects of exercise on cognitive function and the formation of new neurons in the hippocampus in the brain.

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

Samenvatting

ID

NL-OMON29541

Bron
NTR

Verkorte titel
NEUROSHAPE

Aandoening

Healthy volunteers are used to elucidate the biological processes underlying the effects of exercise on the brain. This could in the future be of possible benefit for patients with neurodegenerative disorders, depression, dementia.

NL: Neurodegeneratieve stoornissen, dementie, depressie

Ondersteuning

Primaire sponsor: Academic Medical Center, Amsterdam
Overige ondersteuning: Amsterdam Brain and Cognition

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

- 1.28 ppm peak concentration in hippocampus, to assess neurogenesis (1H-MRS)
- new vascularization (rCBV in hippocampus using contrast-enhanced MRI)
- pattern separation

Toelichting onderzoek

Doel van het onderzoek

Physical exercise is not only beneficial for general health, but has also been shown to improve brain function (cognition) and influence brain structure (increase brain volume, especially in the hippocampus). However, the underlying neural mechanisms that cause this increase in volume are relatively unknown. Animal studies have shown that physical exercise can increase the formation and survival of new neurons, a process called neurogenesis. In addition, these new neurons are involved in cognition, especially in hippocampal-dependent pattern separation. We hypothesize that exercise could also increase neurogenesis in the human hippocampus. The recently developed and validated non-invasive magnetic resonance spectroscopy (MRS) now allows to reliably detect neurogenesis for the first time in the live human brain.

Exercise has also been demonstrated to influence the formation of new blood vessels (angiogenesis) in the hippocampus in rodents, a process which is closely linked to neurogenesis. Angiogenesis can be measured in the human brain by contrast-enhanced MRI, exploiting the leakiness of new vessels. In this study, we aim to study the effect of exercise on neurogenesis and angiogenesis and elucidate the link to brain function in the hippocampus.

Onderzoeksopzet

All measurements at baseline (week 0) and then again after 3 months of exercise (week 12-13).

Onderzoeksproduct en/of interventie

Aerobic exercise intervention

Those subjects randomized to the aerobic exercise group will undergo a 12-week exercise program, in which they will engage in 45 minutes of aerobic exercise 3x weekly. Every two weeks the researchers will contact the subjects and will administer questionnaires.

Control exercise intervention

Those subjects randomized to the control group will undergo a 12-week exercise program, in which they will engage in 45 minutes of stretching and toning exercise 3x weekly. Every two weeks the researchers will contact the subjects and will administer questionnaires.

Contactpersonen

Publiek

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

Age 18-30 years, BMI < 30 kg/m2, stable exercise history 3 months prior to study inclusion.

Belangrijkste redenen om niet deel te kunnen nemen (Exclusiecriteria)

current intensive sports (>3 times/week), excessive smoking (>1 pack/day), alcohol (>21 units/week), or other regular drug use, history of chronic renal insufficiency, prior allergic reaction to Gadolinium-containing compounds, psychiatric disorders and general contraindications for MRI.

Onderzoeksopzet

Opzet

Type:	Interventie onderzoek
Onderzoeksmodel:	Parallel
Toewijzing:	Gerandomiseerd
Blindering:	Open / niet geblindeerd
Controle:	Geneesmiddel

Deelname

Nederland

Status:	Werving gestart
(Verwachte) startdatum:	15-08-2016
Aantal proefpersonen:	52
Type:	Verwachte startdatum

Ethische beoordeling

Positief advies

Datum:	03-08-2016
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

ID: 43536
Bron: ToetsingOnline
Titel:

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL5847
NTR-old	NTR6026
CCMO	NL55943.018.15
OMON	NL-OMON43536

Resultaten