

Imaging the brain of children with obesity.

No registrations found.

Ethical review	Positive opinion
Status	Other
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON27404

Source

NTR

Health condition

Obesity (according to the international criteria of Cole et al (2000); BMI in adults between 30-35 kg/m²)

Sponsors and support

Primary sponsor: Prof.dr.H.A.Delemarre-van de Waal

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Source(s) of monetary or material Support: Danone research

Intervention

Outcome measures

Primary outcome

1. Structural measurements of neural structures involved in eating behavior (amygdala, nucleus accumbens, hippocampus, insula) in obese and non-obese adolescents;
2. Neuronal responses in a resting state condition in obese and non-obese adolescents;
3. Neuronal responses to food stimuli (eg prefrontal cortex) in obese and non obese adolescents.

Secondary outcome

N/A

Study description

Background summary

Title:

Neuroimaging of childhood obesity: A case control study.

Background:

The prevalence of overweight and obesity among children is alarmingly high. Childhood obesity is associated with serious health risks. Obesity is the result of a disturbed balance between energy intake and expenditure. The brain is the central regulator of energy balance. Brain areas that play crucial roles in eating behaviour are the hypothalamus, the mesolimbic dopamine system and the prefrontal cortex. Several imaging studies have revealed the complexity of the human brain mechanisms related to eating behaviour. The exact neuropathophysiological mechanisms underlying obesity are unclear. This (functional) magnetic resonance imaging ((f)MRI) study might be helpful to disentangle these mechanisms underlying childhood obesity, a predictor of adult obesity. In addition, these results might offer the opportunity to develop novel therapeutic targets.

Aim:

To demonstrate differences in neuronal structure and function in the brain regions that control eating behaviour between obese and normal weight adolescents.

Study proposal:

A centre for childhood obesity at the LUMC is established. In this centre we will collect a variety of data for diagnostic and treatment purposes. We aim to perform (f)MRI of the regions of the brain involved in eating behaviour in patients of our centre and in age- and sex-matched healthy normal weight controls. We will compare their brain structures and their neuronal activity in a resting state condition and in response to a passive visual (food) stimulus.

Study population:

10 obese male and 10 obese female adolescents, age 12-16 years, will be selected at the centre for childhood obesity at the LUMC. 10 male and 10 female normal weight controls will be recruited among age matched peers of obese patients. Patients will be asked whether they want to ask a lean friend who is willing to participate as control in our research project.

Outcome:

Evaluation of neuroimaging of obese youngsters and controls: Do structure and function of the brain regions involved in eating behaviour differ between the obese group and normal-weight peers as measured with (f)MRI?

Study objective

We hypothesize that early programming leads to differential brain function. A result of these changes in brain function will be differences in energy expenditure and food intake leading to different eating behaviour and differences in sensitivity to therapeutic interventions. We propose to perform a neuroimaging case control study in childhood obesity with patients from the centre for childhood obesity at the Leiden University Medical Center (LUMC). Using structural and functional MRI in a case-control study we would like to answer the question: Are the neuronal structures and processes, which are involved in eating behaviour, different in obese adolescents compared to lean peers? With the answer to this question we expect to obtain better insight in the neuropathophysiology of childhood obesity and perhaps we uncover novel therapeutic targets for future obesity therapy. For therapeutic intervention it is important to unravel individual characteristics connected with obesity.

We hypothesize that MRI images will display differences in the neuronal structures involved in eating behaviour (prefrontal cortex, amygdala, nucleus accumbens) when we compare obese and lean adolescents. In addition, we expect to show differences with functional magnetic resonance imaging in a resting state condition as well as in a passive visual stimuli test when we compare obese adolescents with lean peers.

Study design

Participants are asked to have their last meal 2 hours before scanning. Participants will have a structural and functional 3D T1-weighted MRI.

Intervention

Structural and functional MRI; Functional MRI consists of a resting state measurement and an passive image paradigm. These images are in the category of healthy and unhealthy food and non-food images.

Contacts

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Eligibility criteria

Inclusion criteria

Cases and controls:

1. Male (n=10) and female (n=10);
2. Participant in the age group 12-16 years.

Cases:

1. Obesity according Cole (2000).

Controls:

1. Weight between + and - 1 SD.

Exclusion criteria

Cases:

1. Overweight caused by a medical problem (determined by our standard protocol);
2. Weight loss in the three months prior to the study.

Cases and controls:

1. Claustrophobia;
2. Behavioural or emotional problems;
3. Mental retardation;
4. Vision problems (determined anamnestic);
5. Participants with any special diet (e.g. a vegetarian diet);
6. Wearing of metal objects that cannot be removed (braces, piercing).

Study design

Design

Study type:	Observational non invasive
Intervention model:	Parallel
Allocation:	Non-randomized controlled trial

Control: N/A , unknown

Recruitment

NL	
Recruitment status:	Other

Start date (anticipated):	01-10-2010
Enrollment:	40
Type:	Unknown

Ethics review

Positive opinion	
Date:	06-09-2010
Application type:	First submission

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
NTR-new	NL2423
NTR-old	NTR2531
Other	METC Leids Universitair Medisch Centrum : P10.105
ISRCTN	ISRCTN wordt niet meer aangevraagd.

Study results

Summary results

N/A