Fatigue after prophylactic cranial irradiation in stage-I-III small cell lung cancer patients: is there a substrate on functional magnetic resonance imaging of the brain?

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON29029

Source
NTR

Brief title
fatigue, prophylactic cranial irradiation, small cell lung cancer, MRI

Health condition

fatigue, prophylactic cranial irradiation, small cell lung cancer, MRI
vermoeidheid, profylactische schedelbestraling, kleincellig longcarcinoom, MRI

Sponsors and support

Primary sponsor: AzM
PO Box 5800 6202 AZ Maastricht
The Netherlands
Source(s) of monetary or material Support: applications for funding running, at the moment no funding

Intervention

Outcome measures

Primary outcome

Changes in white matter integrity and bold response after PCI. Differences between SCLC patients and controls for change in white matter integrity and bold response.

Secondary outcome

- Relationship between changes in MRI parameters and changes in MVI-20, EORTC c30, EuroQol-5D , HADS and CFQ

- Relationship between changes in MRI parameters and changes in IL-6, TNF¦Á, CRP and leukocytes/differential

- To evaluate whether there are differences on MRI findings/laboratory findings / questionnaires between SCLC patients treated with PCI, NSCLC patients and healthy controls

Study description

Background summary

Rationale: Cancer related fatigue (CRF) is a common problem in cancer patients. 50-90% of these patients report fatigue, the highest percentage is found in patients treated with chemo- and/or radiotherapy. Before starting cancer treatment, cancer patients already report fatigue and cognitive problems. Symptoms often worsen during and after treatment.

CRF may represent imbalances in inflammatory and inhibitory mechanisms induced by cancer and/or chemo- and radiotherapy. For example, in some studies elevated levels of fatigue have been reported in association with increased serum measurements of pro-inflammatory cytokines like IL-6 and TNF-¦Á. The hypothesis is that these cytokines cause alterations in the central nervous system (CNS) promoting fatigue. Recently, researchers started to investigate organic substrate in fatigue using functional and structural magnetic resonance imaging (MRI) of the brain as well in non-oncological as oncological patients. Fatigue was linked with regions of decreased frontal and basal ganglia perfusion. MRI is more sensitive in detecting functional differences than behavioural measurements alone. Prophylactic cranial irradiation (PCI) is standard treatment in small cell lung cancer (SCLC) patients with response or stable disease after first line treatment (chemoradiotherapy in stage I-III, chemotherapy in stage IV). These patients report in the first 3 months after PCI significantly more fatigue than patients who have not had PCI, but there are not many data regarding MRI and PCI. In this pilot study we want to evaluate whether there is a substrate for

fatigue on MRI and whether there is a correlation with pro-inflammatory cytokines.

Objective: To asses the effect of PCI on the brain with functional MRI (fMRI) and diffusion tensor imaging (DTI)-MRI and assess whether there is a correlation with patient-experienced fatigue.
Study design: prospective study

Study population: 22 stage I-III SCLC patients who have completed chemoradiation and are eligible for PCI. Control groups: 12 stage III non-small cell lung cancer (NSCLC) patients who have completed chemoradiation, 12 matched (age, gender, smoking status) healthy individuals.

Intervention: MRI will be performed approximately one week before PCI and two weeks after PCI. Blood samples will be drawn on the same day as the MRI. Fatigue and quality of life will be measured with questionnaires (MVI-20, EORTC c30, EuroQol-5D) on the same day as the MRI. Screening for depression (HADS), cognitive failure (CFQ) will also be done on the same days. The day of the first MRI also includes a personality test (NEO-FFI).

Main study parameters/endpoints: Changes in white matter integrity and bold response after PCI. Differences between SCLC patients and controls for change in white matter integrity and bold response.
Nature and extent of the burden and risks associated with participation, benefit and group relatedness: The MRI-techniques and questionnaires that are used in this study are non-invasive. The risks of a MRI-scan are negligible because it is a magnetic field, does not involve ionizing radiation and does not require contrast agents or anesthesia.
The MRI will be performed twice, preferably the same day as when a regular visit to the radiation oncologist is scheduled. Time per MRI is approximately 30 minutes. The MVI-20, EORTC c30 and EuroQol 5D questionnaires are validated in cancer patients, duration per set of questionnaires is approximately 5 minutes. Screening for depression (HADS) and cognitive failure (CFQ) will also be done (duration per questionnaire approximately 5 minutes). These questionnaires will be taken at the same day as the MRI. The first time the questionnaires also include a personality test (NEO-FFI, duration 10 minutes). Blood samples will be withdrawn twice, total amount is 20 ml. There is no direct benefit for the patient. This is a study to evaluate the usefulness of MRI in fatigue after PCI in order to incorporate this assessment in intervention studies.

Study objective

Cancer related fatigue (CRF) is a common problem in cancer patients. 50-90% of these patients report fatigue, the highest percentage is found in patients treated with chemo- and/or radiotherapy. Before starting cancer treatment, cancer patients already report fatigue and cognitive problems. Symptoms often worsen during and after treatment.

CRF may represent imbalances in inflammatory and inhibitory mechanisms induced by cancer and/or chemo- and radiotherapy. For example, in some studies elevated levels of fatigue have been reported in association with increased serum measurements of pro-inflammatory cytokines like IL-6 and TNF-¦Á. The hypothesis is that these cytokines cause

alterations in the central nervous system (CNS) promoting fatigue. Recently, researchers started to investigate organic substrate in fatigue using functional and structural magnetic resonance imaging (MRI) of the brain as well in non-oncological as oncological patients. Fatigue was linked with regions of decreased frontal and basal ganglia perfusion. MRI is more sensitive in detecting functional differences than behavioural measurements alone. Prophylactic cranial irradiation (PCI) is standard treatment in small cell lung cancer (SCLC) patients with response or stable disease after first line treatment (chemoradiotherapy in stage I-III, chemotherapy in stage IV). These patients report in the first 3 months after PCI significantly more fatigue than patients who have not had PCI, but there are not many data regarding MRI and PCI. In this pilot study we want to evaluate whether there is a substrate for fatigue on MRI and whether there is a correlation with pro-inflammatory cytokines

Intervention

MRI will be performed approximately one week before PCI and two weeks after PCI. Blood samples will be drawn on the same day as the MRI. Fatigue and quality of life will be measured with questionnaires (MVI-20, EORTC c30, EuroQol-5D) on the same day as the MRI. Screening for depression (HADS), cognitive failure (CFQ) will also be done on the same days. The day of the first MRI also includes a personality test (NEO-FFI).

Contacts

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Eligibility criteria

Inclusion criteria

Stage I-III SCLC:

- Age >/= 18 years

- stage I-III SCLC pathology proven

- Completed initial treatment with chemoradiotherapy, with at least stable disease (SD)

- WHO PS < 2

- Ability to understand written questionnaires

- Written informed consent

Stage III NSCLC:

- Age > 18 years

- stage I-III NSCLC pathology proven

- Completed treatment with chemoradiotherapy, with at least SD

- WHO PS < 2

- Ability to understand written questionnaires

- Written informed consent

Healthy controls:

- Age >18 years

- WHO PS < 2

- Ability to understand written questionnaires

- Written informed consent

Exclusion criteria

- Prior radiotherapy to the brain

- Claustrophobia

- Pregnancy

- Metal implants or other contraindication for MRI

- Inability to lie supine for 30 minutes time (MRI)

- Antidepressants or steroids for the last two weeks

- Clinically relevant anemia (defined as Hb < 5.5 mmol/l)

- Chronic renal failure (defined as MDRD-eGFR < 30 ml/min/1.73m)

- Liver biochemistry abnormalities (defined as more than two times upper limit of normal)

- Major psychiatric illness requiring intervention in secondary care

Study design

Design

Study type:	Interventional
Intervention model:	Other
Allocation:	Non-randomized controlled trial

Control: N/A , unknown

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	01-02-2015
Enrollment:	46
Type:	Anticipated

Ethics review

Positive opinion

Date:	06-10-2014

Application type: First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 41049
Bron: ToetsingOnline
Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL4683
NTR-old	NTR4837
CCMO	NL48269.068.14
OMON	NL-OMON41049

Study results