The effect of different radiotherapy regimen on the immune cell landscape

Published: 11-04-2019
Last updated: 11-04-2024

We want to investigate what happens to the immune cells during different types of radiotherapy (schedules). With this study, we want to take blood samples from patients during their standard radiotherapy for cancer and determine the effect on immune...

Ethical review	Approved WMO
Status	Recruiting
Health condition type	Miscellaneous and site unspecified neoplasms benign
Study type	Observational invasive

Summary

ID

NL-OMON52433

Source
ToetsingOnline

Brief title
The effect of radiotherapy on immune cell landscape

Condition

- Miscellaneous and site unspecified neoplasms benign

Synonym
cancer, tumor

Research involving
Human

Sponsors and support

Primary sponsor: Radboud Universitair Medisch Centrum
Source(s) of monetary or material Support: Ministerie van OC&W,Radboud Oncologie Fonds

Intervention

Keyword: cancer, immune cells, immunotherapy, radiotherapy

Outcome measures

Primary outcome

Immune cells will be characterized by flow cytometry, including CD4, CD8 and regulatory T cells, Natural Killer cells, MDSCs and macrophages. We will also look at the activation markers such as CD28, CD137 and CD66b, and the inhibitory markers PD1, PDL-1. RNA will be isolated from the immune cells for any specific gene expression analyzes or RNAseq. The effect of the various radiotherapy regimens on the dynamics of these immune cells will be determined.

Secondary outcome

Above mentioned immune cell markers will be quantified in biopsies using immunohistochemistry. The microbiome will be examined in faeces.

Study description

Background summary

Immunotherapy is a relatively new form of therapy for the treatment of patients with cancer. In this form of therapy, the own immune system is used to clean up cancer cells, often in combination with other forms of treatment. Because the body attacks the cancer cells, there is only a limited chance of side effects. Immunotherapy is now considered the 4th pillar in the treatment of patients with cancer, in addition to surgery, radiotherapy and chemotherapy. An important next step is how we can best combine immunotherapy with the various other forms of cancer therapy. More than half of the patients with cancer also undergo radiotherapy during treatment. Recent studies in which radiotherapy and immunotherapy are combined show promising results, but radiotherapy at the wrong time or with the wrong dose can also reduce the immune response. To investigate the optimal relationship between radiotherapy and the immune system, we would like to characterize the immune cells in the blood and, if possible, in the tumor. The status of our gut (microbiome) is also important

for the functioning of our immune system. By combining data from blood, tumor and the intestine, we hope to be able to determine the optimal combination.

Study objective

We want to investigate what happens to the immune cells during different types of radiotherapy (schedules). With this study, we want to take blood samples from patients during their standard radiotherapy for cancer and determine the effect on immune cells. The effect of the radiation will also be examined in tumor material that will be obtained via a second biopsy in a small part of the patients during the irradiation, ie in easily accessible (oral) cancer.
Finally, we also want to examine the microbiome in the intestine during radiotherapy. Insight into this will lead to the more specific giving of a specific combination of radio- and immunotherapy.

Study design

Patients who visit the radiotherapy department of the Radboudumc for radiotherapy of head and neck-, lung- or prostate cancer will be asked to donate a few tubes of blood before, during and after treatment (3 to 5 times in total, 60 ml per venipuncture). The patient is given time to decide on participation during the preparation of the treatment plan etc (3-7 days). The first blood sample will be drawn just before the first radiotherapy fraction. A 2nd venipuncture will be performed just before the 2nd fraction, and blood will be taken one week after the last treatment. With the long treatment schedules, we want to take 1 or 2 more blood samples. Immune cells will be characterized by flow cytometry, including CD4, CD8 and regulatory T cells, Natural Killer cells, MDSCs and macrophages. We will also look at the activation markers such as CD28, CD137 and CD66b, and the inhibitory markers PD1, PDL-1, CTLA4. RNA will be isolated for specific gene expression analyses or RNAseq. For oral tumors we want to take a 2nd biopsy under local anesthesia. Here, too, we want to characterize the immune cells with the help of immunohistochemistry for the same markers. The microbiome will be characterized in stool samples taken before and after radiotherapy.

Study burden and risks

The extent of burden due to 3-5 venepunctures is limited and the risk with standard venapuncture is very limited. The biopsies in a small proportion of patients will be taken under local anesthesia, and generate a small risk of limited bleeding. Feces will be collected at home without risk to the patient. This study has no effect on, or consequences for, the standard treatment. Patients will not have to come to the Radboudumc for the blood samples as they will be taken during the standard treatment schedule of the patients.

Contacts

Public
Radboud Universitair Medisch Centrum

Geert Grooteplein zuid 32
Nijmegen 6525GA
NL
Scientific
Radboud Universitair Medisch Centrum

Geert Grooteplein zuid 32
Nijmegen 6525GA
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

- treated with radiotherapy for cancer at the Radboudumc
- understand dutch
- mentally competent
- 30-80 years old

Exclusion criteria

- autoimmune disease
- immune- suppressive drugs (with the exception of <= 10 mg prednisone or equivalent doses of corticosteroids).

Study design

Design

Study type: Observational invasive

Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	18-11-2019
Enrollment:	200
Type:	Actual

Ethics review

Approved WMO Date:	11-04-2019
Application type:	First submission
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)
Approved WMO Date:	20-04-2022
Application type:	Amendment
Review commission:	CMO regio Arnhem-Nijmegen (Nijmegen)

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
CCMO	NL65536.091.18