Targeting esophageal cancer with HDL nanoparticles: an imaging study

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Main objective:- To assess the tumor uptake of Zr89-labeled CER-001 (% injected dose/gram)Secondary objectives:- To evaluate the biodistribution of Z89r-labeled CER-001- To evaluate the correlation between Zr89-labeled CER-001 and tumor...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Gastrointestinal neoplasms malignant and unspecified
Study type	Observational invasive

Summary

ID

NL-OMON45362

Source
ToetsingOnline

Brief title
TARGET

Condition

- Gastrointestinal neoplasms malignant and unspecified

Synonym
esophageal cancer, gullet cancer

Research involving
Human

Sponsors and support

Primary sponsor: Academisch Medisch Centrum
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: esophageal cancer, HDL, nanomedicine, PET/CT

Outcome measures

Primary outcome

The main objective is to assess the tumor uptake of Zr89-labeled CER-001 in patients with esophageal cancer. The main parameter to study will be percent injected dose per gram (%ID/g) of the tumor.

Secondary outcome

The secondary objective of this study is to evaluate the biodistribution of 89Zr-labeled CER-001. To study this, the uptake of Zr89-labeled CER-001 expressed as %ID/g in different organs will be determined.

We will evaluate the tumor microcirculation using DCE-MRI and DWI/IVIM MRI and study whether MRI parameters are correlated to tumor uptake of Zr89-labeled CER-001. In addition, we will evaluate the correlation between histological markers from the biopsy material from the tumor and Zr89-PET signal and MRI parameters.

Study description

Background summary

Recent pre-clinical studies have demonstrated that reconstituted radio-labeled HDL nanoparticles may be used for Zr89-PET imaging of tumors, with specificity for tumor associated macrophages. In cancer patients, Zr89-labeling of the HDL mimetic CER-001 allows for non-invasive evaluation of the potential of HDL nanomedicinal strategies in esophageal cancer.

Study objective

Main objective:
- To assess the tumor uptake of Zr89-labeled CER-001 (% injected dose/gram)

Secondary objectives:
- To evaluate the biodistribution of Z89r-labeled CER-001
- To evaluate the correlation between Zr89-labeled CER-001 and tumor microcirculation as assessed with Dynamic Contrast Enhanced-MRI (DCE-MRI) and Diffusion Weighted Imaging/Intravoxel Incoherend Motion (DWI/IVIM) MRI
- To evaluate whether histological markers of the tumor biopsy correlate with Zr89- PET signal and MRI parameters

Study design

This study is designed as a single-center observational study. Patients with pathologically confirmed esophageal cancer will be included for this study and visit the study center three times.

Study burden and risks

The results of this study contribute to the development of novel imaging and therapeutic approaches to ultimately reduce morbidity and mortality in cancer. Considering the poor prognosis in certain cancer types such as esophageal cancer, clinically establishing the nanodelivery paradigm using HDL particles may have great implications for these diseases. HDL particles are endogenous carrier vehicles, and may be exploited to deliver chemotherapeutic agents to tumors, thereby increasing efficacy by higher drug delivery to the area of interest, with fewer systemic side effects due to the targeted delivery and lower cumulative dose. We envision that the use of HDL nanoparticles offers a theranostic approach, as it adds to the therapeutic arsenal of treatments, and may also be a means to select suitable patients to allow for personalized treatment.

In the present study, participating subjects receive no direct or immediate benefits. The burden and risk of participating in this study is estimated to be low. Patients will visit the clinical trial unit three times, with a total duration of 300 minutes. Over three visits, a total of 30 ml of blood will be drawn. There are no direct toxic effects associated with the administration of Zr89-labeled CER-001, except for the risks associated with radiation exposure. The maximum exposure related to PET/CT scanning is 41.2 mSv in this study. However, patients included in this study have diagnosed esophageal cancer conferring a poor prognosis and will undergo radiation therapy, making it unlikely that the radiation exposure in this study is relevant. The potential benefits of developing HDL nanotherapy for cancer is expected to compensate for the radiation risk. In addition, this study is relevant for a much larger group

of cancer patients, who will not have to be exposed to these risks due to this study.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

In order to be eligible to participate in this study, a subject must meet all of the following criteria:
- Adult patients (either gender) older than 18 years
- Clinical diagnosis of primary esophageal cancer

Exclusion criteria

A potential subject who meets any of the following criteria will be excluded from participation in this study:
- Any treatment that could interfere with the conduct or interpretation of the study in the opinion of the investigator
- Any clinically relevant condition that could interfere with the conduct of the study in the opinion of the investigator
- Standard contra-indications to PET, CT or MRI
- Inability or unwilling to comply with protocol requirements, or deemed by the investigator to have a disorder that may compromise the ability to give informed consent and/or to comply with all required study procedures and visits

Study design

Design

Study phase:	2
Study type:	Observational invasive
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	30-10-2017
Enrollment:	13
Type:	Actual

Medical products/devices used

Generic name:	MRI
Registration:	Yes - CE intended use
Product type:	Medicine
Brand name:	89Zr-labeled CER-001
Generic name:	Zirconium-89 labeled CER-001

Ethics review

Approved WMO Date:	07-07-2017
Application type:	First submission
Review commission:	METC Amsterdam UMC
Approved WMO Date:	04-07-2018
Application type:	First submission
Review commission:	METC Amsterdam UMC

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
EudraCT	EUCTR2017-000724-10-NL
CCMO	NL60978.018.17

Study results

Date completed:	14-06-2018
Actual enrolment:	9