ISRCTN16325499 https://doi.org/10.1186/ISRCTN16325499

Focal high-dose-rate brachytherapy in the treatment of patients diagnosed with low or favorable – intermediate-risk prostate cancer

Submission date
18/11/2022

Recruitment status
Recruiting

Registration date
29/11/2022

Overall study status
Ongoing

Last Edited
29/11/2022

Condition category
Cancer

[X] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Focal low-dose-rate (LDR) brachytherapy involves the permanent or temporary placing of radioactive seeds in the prostate that will deliver radiation over time to fight prostate cancer (PCa), while focal high-dose-rate (HDR) involves inserting flexible needles into the prostate to deliver a high dose of radiation over a few minutes. There are no studies that compare focal HDR brachytherapy with focal LDR brachytherapy and active surveillance. The published results evaluating the safety and effectiveness of focal HDR brachytherapy are not comprehensive and do not provide valuable recommendations for clinicians. In a recent literature review, the authors emphasized that prospective clinical trials comparing standard of care (active surveillance) with focal therapy were needed for focal therapy to become the standard of care in the treatment of patients diagnosed with nonmetastatic low and intermediate-risk prostate cancer. Additionally, clinical studies using in vivo dosimetry (a radiation measurement that is acquired while the patient is being treated) with focal HDR brachytherapy to ensure dose conformity and adequacy are lacking, or results were still pending. The results of this study would allow a more accurate selection of patients for whom focal brachytherapy can be applied and will allow the evaluation of the changes in their quality of life compared to other treatment methods. Based on the results of this clinical trial, it will be possible to achieve better control of localized low and favorable intermedium-risk PCa, avoid damage to adjacent organs, and improve patients' quality of life. The main goals of this study were to evaluate the quality of life, risk of progression and time to progression in patients treated with focal HDR brachytherapy compared with those treated with LDR brachytherapy and usual care (active surveillance). Additionally, the study will assess early and late genitourinary and gastrointestinal reactions to both methods and the importance and significance of in vivo dosimetry to focal HDR brachytherapy.

Who can participate?
Patients aged 40 to 75 years old diagnosed with a low- or favorable intermediate-risk PCa

What does the study involve?
Patients will be randomized to either an active surveillance (AS) group, which is a control (or

dummy) group that receives the standard approach proposed in clinical practice, a focal LDR brachytherapy group or a focal HDR brachytherapy group. Focal LDR and HDR brachytherapy will be performed under general or spinal anesthesia and transrectal ultrasound control. In focal LDR brachytherapy, radioactive seeds will be implanted into the tumor tissue, while in focal HDR brachytherapy special hollow needles will be inserted into the tumor and radioactive iridium 192 isotope will be delivered through special catheters.

What are the possible benefits and risks of participating?
Participants will not receive any financial benefits. The scientific and practical benefits of the study will be determined after analyzing and summarizing all the results of this biomedical study.

Subjects in the active surveillance group remain at risk of experiencing anxiety about an untreated disease. Subjects in the focal LDR and focal HDR brachytherapy groups are at risk of experiencing potential adverse events:
1. Common (passes by itself): bruises in the skin of the perineum; perineal soreness
2. Rare: a rise in body temperature; blood in the urine; frequent urination at night, swelling of the prostate; urinary retention
3. Very rare: urinary incontinence; inflammation of the rectum; painful defecation; sexual dysfunction
All subjects included in the study are covered by the principal investigators' and biomedical research clients' indemnity insurance.

Where is the study run from?
National Cancer Institute (Lithuania)

When is the study starting and how long is it expected to run for?
May 2022 to September 2032

Who is funding the study?
Lithuanian Association of Urologists (Lithuania)

Who is the main contact?
Dr Marius Kinčius, marius.kincius@nvi.lt (Lithuania)

Contact information

Type(s)
Principal investigator

Contact name
Dr Marius Kinčius

Contact details
National Cancer Institute
Santariskiu Str. 1
Vilnius
Lithuania
LT-08406
+37065215045
marius.kincius@nvi.lt

Additional identifiers

Protocol serial number
ZB_01_NV1

Study information

Scientific Title
The safety and efficacy of focal high-dose-rate brachytherapy in the treatment of patients diagnosed with low or favorable – intermediate-risk prostate cancer and compared with low-dose-rate brachytherapy and active surveillance

Acronym
FocalHDRBT

Study objectives
Focal high-dose-rate brachytherapy is an equivalent treatment method when compared to focal low-dose-rate brachytherapy and active surveillance.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 14/06/2022, Vilnius regional bioethics committee (M.K.Čiurlionio str. 21, Vilnius, LT-03101, Lithuania; +37 8 614 26126; rbtek@mf.vu.lt.), ref: 2022/6-1438-911

Primary study design
Interventional

Study design
Randomized controlled trial

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Low or favorable – intermediate-risk prostate cancer

Interventions
A sealed envelope method of randomization will be used to assign participants to the following groups:
Active Surveillance (AS) group
This is a control group and a standard approach proposed in clinical practice for patients diagnosed with low- or favorable intermediate-risk PCa.

Focal low dose-rate (LDR) brachytherapy group
This is a standard treatment method within the framework of clinical trials. The effectiveness and safety of focal LDR brachytherapy are well-studied and described in the scientific literature. Focal LDR brachytherapy will be performed under general or spinal anesthesia, under transrectal ultrasound control, implanting 125I radioactive seeds into the tumor tissue. A planned dose to

be administered by the implanted seed is 145 Gy, which complies with safe dosimetric plan parameters.

Focal high dose-rate (HDR) brachytherapy group
This study group will be compared with the rest of the groups. Focal HDR brachytherapy is performed under general or spinal anesthesia, under transrectal ultrasound control, inserting special hollow needles into the tumor, and delivering radioactive iridium 192 isotope through special catheters. During the procedure, the delivered dose will be monitored by in vivo dosimeters. During focal HDR brachytherapy, a single dose of 19 Gy is administered to the tumor located in the prostate, visible in the magnetic resonance imaging images and localized by transrectal ultrasound, in compliance with the safe dosimetric parameters of the plan.

Intervention Type
Procedure/Surgery

Primary outcome(s)
1. Quality of life (QoL) measured using European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life of Cancer Patients questionnaire (QLQ-C30) and an additional module for prostate cancer patients (PR25) at baseline, months 1 and 6 and then every 6 months until the end of the study
2. Erectile function measured using the international index of erectile function (IIEF-5) questionnaire at baseline, months 1 and 6 and then every 6 months until the end of the study
3. Urinary function measured using the international prostate symptom score (IPSS) and interpreting the results of uroflowmetry at baseline, months 1 and 6 and then every 6 months until the end of the study
4. Progression-free survival and time to recurrence measured using standard tests performed on subjects diagnosed with PCa including prostate-specific antigen level, PSA doubling time (PSADT), a mpMRI examination, and a systematic and targeted biopsy guided by TRUS-MRI fusion images at 12 months after inclusion and later on if there is a suspicion of progression. We will assume that there is disease progression when confirmation after TRUS-MRI fusion guided focal and/or a systematic 12-needle biopsy.

Key secondary outcome(s)
1. Early and late gastrointestinal and genitourinary radiation toxicities after focal treatment measured using the Radiation Therapy Oncology Group (RTOG) at baseline, months 1 and 6 and then every 6 months until the end of the study
2. Evaluation of the significance and importance of the in vivo dosimetry performed measured by comparing the actual dose of ionizing radiation administered to the patient during the focal HDR brachytherapy procedure and comparing it with the actual prescribed dose. Measurements will be performed using a dosimetric system created in the applied physics department of Vilnius University at the time of the focal HDR brachytherapy procedure

Completion date
01/09/2032

Eligibility

Key inclusion criteria
1. Aged 40 to 75 years old
2. Multiparametric magnetic resonance tomography (mpMRI) was performed, and the tumor was verified by transrectal ultrasound (TRUS) – mpMRI fusion guided biopsy together with systemic

biopsy
3. Histologically confirmed low- or favorable intermediate-risk PCa from mpMRI visible lesions only that meet the following criteria and there is no disease found in systemic biopsy (PSA ≤ 10 ng/ml; ISUP ≤ 2; T1 – T2b)
4. Less than 25 % of biopsies were affected
5. The size of the prostate does not exceed 60 cm3
6. Index lesion is larger than 0.5 cm3 or 6 mm in diameter
7. IPSS score is not greater than 18 points
8. Agrees to participate in the study and signs the consent form

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
40 Years

Upper age limit
75 Years

Sex
Male

Key exclusion criteria
1. Previous radical prostate cancer treatment
2. Proven extracapsular extension of disease
3. Metastatic tumors

Date of first enrolment
01/01/2023

Date of final enrolment
01/01/2028

Locations

Countries of recruitment
Lithuania

Study participating centre
National Cancer Institute
Santariskių str. 1

Vilnius
Lithuania
LT-08660

Sponsor information

Organisation
National Cancer Institute

ROR
https://ror.org/04w2jh416

Funder(s)

Funder type
Research organisation

Funder Name
Lithuanian Association of Urologists

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analyzed during the current study will be available upon reasonable request from Dr Marius Kinčius (marius.kincius@nvi.lt)

IPD sharing plan summary
Available on request