

Thrombin inhibition preoperatively in early breast cancer

Submission date 05/11/2015	Recruitment status No longer recruiting	☒ Prospectively registered ☒ Protocol
Registration date 05/11/2015	Overall study status Completed	☐ Statistical analysis plan ☐ Results
Last Edited 16/04/2021	Condition category Cancer	☐ Individual participant data ☐ Record updated in last year

Plain English summary of protocol

<http://www.cancerresearchuk.org/about-cancer/find-a-clinical-trial/a-trial-looking-at-a-blood-thinning-drug-for-women-with-breast-cancer-tip>

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Additional identifiers

Clinical Trials Information System (CTIS)
2014-004909-33

Protocol serial number
19731

Study information

Scientific Title
Thrombin Inhibition Preoperatively in early breast cancer (TIP study)

Acronym
TIP

Study objectives
Current study hypothesis as of 20/09/2018:
The aim of this study is to determine whether preoperative oral Factor Xa inhibitor (Rivaroxaban) in oestrogen receptor negative early breast cancer patients results in inhibition of tumour proliferation markers as determined by a reduction in tumour Ki67 from baseline (pretreatment) to post treatment (at time of surgical excision/research core biopsy).

Previous study hypothesis:
The aim of this study is to determine whether preoperative oral Factor Xa inhibitor (Rivaroxaban) in oestrogen receptor negative early breast cancer patients results in inhibition of tumour proliferation markers as determined by a reduction in tumour Ki67 from baseline (pretreatment) to post treatment (at time of surgical excision).

Ethics approval required
Old ethics approval format

Ethics approval(s)
First Medical Research Ethics Committee, 13/07/2015, ref: 15/NW/0406

Primary study design
Interventional

Study design
Randomised controlled trial

Study type(s)
Treatment

Health condition(s) or problem(s) studied

Breast cancer

Interventions

Current interventions as of 20/09/2018:

Patients will be randomised into 2 groups in a 1:1 ratio as follows:

Group 1: Preoperative Rivaroxaban 20mg od and excisional approx 14 days later

Group 2: No Preoperative therapy with surgery/research core biopsy approx 14 days later

Patients should have their surgery/neoadjuvant chemotherapy booked prior to randomisation and scheduled for around two weeks ahead. All surgery will be completed to standard care.

Patients will return 2 weeks following the date of surgery for post-op complications and adverse events review. All further follow-up will be as per standard NHS practice with annual clinical and mammographic examination.

Previous interventions:

Patients will be randomised into 3 groups in a 1:1:1 ratio as follows (with the Rivaroxaban treatment groups being combined for primary endpoint analysis creating a 2:1 randomisation for Rivaroxaban vs. no treatment):

Group 1: Preoperative Rivaroxaban 20mg od and excisional approx 14 days later

Group 2: Preoperative Rivaroxaban 10mg od and excisional approx 14 days later

Group 3: No Preoperative therapy with surgery approx 14 days later

Patients should have their surgery booked prior to randomisation and scheduled for around two weeks ahead, as long it is within 31 days from diagnosis. All surgery will be completed to standard care.

Patients will return 2 weeks following the date of surgery for post-op complications and adverse events review. All further follow-up will be as per standard NHS practice with annual clinical and mammographic examination.

Intervention Type

Drug

Phase

Not Applicable

Drug/device/biological/vaccine name(s)

Rivaroxaban

Primary outcome(s)

Current primary outcome measure as of 20/09/2018:

Percentage reduction in tumour Ki67 expression is measured using tumour core biopsies at baseline (pre-rivaroxaban), surgery/research core biopsy (post-rivaroxaban).

Previous primary outcome measure:

Percentage reduction in tumour Ki67 expression is measured using tumour core biopsies at baseline (pre-rivaroxaban), surgery (post-rivaroxaban).

Key secondary outcome(s)

Current secondary outcome measure as of 20/09/2018:

In post Rivaroxaban compared to pre- Rivaroxaban patient samples:

1. Reduction in tumour tissue expression of TF, TAT and PAR 1 is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
2. Reduction in tumour tissue expression of CD31 is measured using patient samples at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
3. Increase in tumour tissue expression of p27, cleaved Caspase 3 and TUNEL is measured using patient samples at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
4. Reduction in CTCs is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
5. Increase in circulating free DNA (cfDNA) and decrease in cfDNA Integrity (cfDI) is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
6. Reduction in plasma d-dimer, TF and TAT is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
7. Alterations in proteomics, correlating to tumour response is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)

In post Rivaroxaban compared to post placebo patient samples:

1. Reduction in MFE is measured using patient samples at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
2. Reduction in tumour tissue expression of TF, TAT and PAR 1 is measured using patient samples at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
3. Reduction in tumour tissue expression of CD31 is measured using patient samples at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
4. Increase in tumour tissue expression of p27, cleaved Caspase 3 and TUNEL is measured using patient samples at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
5. Reduction in CTCs is measured using patient samples at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
6. Increase in circulating free DNA (cfDNA) and decrease in cfDNA Integrity (cfDI) is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
7. Reduction in plasma d-dimer, TF and TAT is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)
8. Alterations in proteomics, correlating to tumour response is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery/research core biopsy (post-rivaroxaban)

Previous secondary outcome measure:

In post Rivaroxaban compared to pre- Rivaroxaban patient samples:

1. Reduction in tumour tissue expression of TF, TAT and PAR 1 is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
2. Reduction in tumour tissue expression of CD31 is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
3. Increase in tumour tissue expression of p27, cleaved Caspase 3 and TUNEL is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
4. Reduction in CTCs is measured using patient samples at at baseline (pre-rivaroxaban) and the

time of surgery (post-rivaroxaban)

5. Increase in circulating free DNA (cfDNA) and decrease in cfDNA Integrity (cfDI) is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
6. Reduction in plasma d-dimer, TF and TAT is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
7. Alterations in proteomics, correlating to tumour response is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)

In post Rivaroxaban compared to post placebo patient samples:

1. Reduction in MFE is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
2. Reduction in tumour tissue expression of TF, TAT and PAR 1 is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
3. Reduction in tumour tissue expression of CD31 is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
4. Increase in tumour tissue expression of p27, cleaved Caspase 3 and TUNEL is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
5. Reduction in CTCs is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
6. Increase in circulating free DNA (cfDNA) and decrease in cfDNA Integrity (cfDI) is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
7. Reduction in plasma d-dimer, TF and TAT is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
8. Alterations in proteomics, correlating to tumour response is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)

In post 20mg od Rivaroxaban compared to post 10mg Rivaroxaban patient samples (subgroup analysis):

1. Reduction in MFE is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
2. Reduction in tumour tissue expression of TF, TAT and PAR 1 is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
3. Reduction in tumour tissue expression of CD31 is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
4. Increase in tumour tissue expression of p27, cleaved Caspase 3 and TUNEL is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
5. Reduction in CTCs is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
6. Increase in circulating free DNA (cfDNA) and decrease in cfDNA Integrity (cfDI) is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
7. Reduction in plasma d-dimer, TF and TAT is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)
8. Alterations in proteomics, correlating to tumour response is measured using patient samples at at baseline (pre-rivaroxaban) and the time of surgery (post-rivaroxaban)

Completion date

30/09/2021

Eligibility

Key inclusion criteria

Current inclusion criteria as of 20/09/2018:

1. Provision of written informed consent.
2. World Health Organisation (WHO) performance status 0-1 with no deterioration over the previous 2 weeks
3. Patients must be able to swallow and retain oral medication
4. Female patients, age over 18, with histological confirmation of ER negative (ER Quick Score / Allred ≤ 5) invasive breast carcinoma
5. Any Her2 status
6. AJCC Stage 1- 3 with primary tumour in the breast amenable to biopsies
7. Scheduled to have definitive breast surgery 11 or more days after commencement of treatment or are able to take 11 or more days of rivaroxaban and have an additional core biopsy prior to starting neoadjuvant therapy.
8. Tumour size ≥ 10 mm (large enough to provide sufficient tissue to be taken by core-cut or tru-cut biopsy (free-hand or under ultrasound guidance as per local protocols)).
9. As judged by the Investigator, no evidence of severe or uncontrolled systemic diseases, including uncontrolled hypertension, active bleeding diatheses, or active infection including hepatitis B, hepatitis C and human immunodeficiency virus (HIV). Screening for chronic conditions is not required.
10. No clinically significant abnormalities in the full blood count, renal or liver biochemistry, as decided by the PI, and where the PI is unsure they should contact the CI or Clinical Coordinator for a final decision.
11. Estimated Glomerular Filtration Rate (eGFR) above 50 ml/min.

Previous inclusion criteria:

1. Female patients with histological confirmation of ER negative invasive breast carcinoma
2. Provision of written informed consent.
3. World Health Organisation (WHO) performance status 0-1 with no deterioration over the previous 2 weeks
4. Patients must be able to swallow and retain oral medication
5. AJCC Stage 1-3 with primary tumour in the breast amenable to biopsies
6. Scheduled to have definitive breast surgery 11 or more days after study entry
7. Tumour size ≥ 10 mm (large enough to provide sufficient tissue to be taken by core-cut or tru-cut biopsy (freehand or under ultrasound guidance as per local protocols).
8. As judged by the site's Principal Investigator, no evidence of severe or uncontrolled systemic diseases, including uncontrolled hypertension, active bleeding diatheses, or active infection including hepatitis B, hepatitis C and human immunodeficiency virus (HIV)
9. Full blood count, renal and liver biochemistry (within 10% of laboratory normal limits)
10. EGFR above 50
11. Aged 18 or over

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 Years

Sex

Female

Key exclusion criteria

Current exclusion criteria as of 20/09/2018:

1. Tumour size <10mm
2. Prior treatment for breast or other cancer (excluding non-melanoma skin cancer)
3. Concurrent anticoagulant therapy (excluding antiplatelet therapy such as aspirin or clopidogrel)
4. Concurrent treatment with azole-antimycotics (such as, ketoconazole, itraconazole, voriconazole and posaconazole); clarithromycin; HIV protease inhibitors; dronedarone; strong CYP3A4 inducers (e.g. rifampicin, phenytoin, carbamazepine, phenobarbital or St. John's Wort); strong CYP3A4 or P-gp inhibitors
5. Major surgery within 4 weeks before the first dose of study treatment.
6. Conditions associated with an increased risk of bleeding:
 - 6.1. Major surgery or trauma within the previous month
 - 6.2. Haemorrhagic disorder or bleeding diathesis
 - 6.3. History of intracranial, intraocular, spinal, retroperitoneal or atraumatic intraarticular bleeding
 - 6.4. Gastrointestinal haemorrhage within the past year
 - 6.5. Symptomatic or endoscopically documented gastroduodenal ulcer disease in the previous 30 days
 - 6.6. Any of the following intracranial pathologies: neoplasm, arteriovenous malformation or aneurysm
 - 6.7. Need for anticoagulant treatment of disorders other than atrial fibrillation
 - 6.8. Fibrinolytic agents within 48 hours of study entry
 - 6.9. Uncontrolled hypertension (systolic blood pressure greater than 180 mm Hg and/or diastolic blood pressure greater than 100 mm Hg)
7. Known hypersensitivity or allergy to rivaroxaban and/or excipients
8. Participation in another interventional trial
9. Pregnant or lactating women
10. All women of reproductive potential, unless using at least one contraceptive precaution, which must be a condom for at least two weeks after the end of their treatment

Previous exclusion criteria:

1. Tumour size <10mm
2. Prior treatment for breast or other cancer (excluding non-melanoma skin cancer)
3. Concurrent anticoagulant therapy (excluding antiplatelet therapy such as aspirin or clopidogrel)
4. Concurrent treatment with azole-antimycotics (such as, ketoconazole, itraconazole, voriconazole and posaconazole); clarithromycin; HIV protease inhibitors; dronedarone; strong CYP3A4 inducers (e.g. rifampicin, phenytoin, carbamazepine, phenobarbital or St. John's Wort); strong CYP3A4 or P-gp inhibitors
5. Major surgery within 4 weeks before the first dose of study treatment.
6. Conditions associated with an increased risk of bleeding:
 - 6.1. Major surgery or trauma within the previous month
 - 6.2. Haemorrhagic disorder or bleeding diathesis
 - 6.3. History of intracranial, intraocular, spinal, retroperitoneal or atraumatic intraarticular bleeding
 - 6.4. Gastrointestinal haemorrhage within the past year
 - 6.5. Symptomatic or endoscopically documented gastroduodenal ulcer disease in the previous

30 days

6.6. Any of the following intracranial pathologies: neoplasm, arteriovenous malformation or aneurysm

6.7. Need for anticoagulant treatment of disorders other than atrial fibrillation

6.8. Fibrinolytic agents within 48 hours of study entry

6.9. Uncontrolled hypertension (systolic blood pressure greater than 180 mm Hg and/or diastolic blood pressure greater than 100 mm Hg)

7. Known hypersensitivity or allergy to rivaroxaban and/or excipients

8. Participation in another interventional trial

9. Pregnant or lactating women

10. All women of reproductive potential, unless using at least two contraceptive precautions, one of which must be a condom for at least two weeks after the end of their treatment

Date of first enrolment

01/01/2016

Date of final enrolment

30/06/2021

Locations

Countries of recruitment

United Kingdom

England

Study participating centre

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Wythenshawe Hospital

Southmoor Road

Wythenshawe

Manchester

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M23 9LT

Study participating centre

Macclesfield District General Hospital

Victoria Road

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Study participating centre

North Manchester General Hospital

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Study participating centre
The Royal Liverpool University Hospital
Prescot Street
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Study participating centre
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Study participating centre
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LS9 7TF

Study participating centre
Clatterbridge Hospital
Wirral University Teaching Hospitals NHS Foundation Trust
Clatterbridge Road
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Study participating centre
Churchill Hospital
Oxford Health NHS Foundation Trust
Old Road
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Sponsor information

Organisation

Manchester University NHS Foundation Trust

ROR

<https://ror.org/00he80998>

Funder(s)

Funder type

Government

Funder Name

National Institute for Health Research

Alternative Name(s)

National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type

Government organisation

Funding Body Subtype

National government

Location

United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

The data sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary

Other

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	27/08/2020	02/09/2020	Yes	No
HRA research summary			28/06/2023	No	No
Study website	Study website	11/11/2025	11/11/2025	No	Yes