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A pilot study to determine the effect of dietary intervention on novel biomarkers of breast cancer risk

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Registration date 28/09/2007	**Overall study status** Completed	
Last Edited 04/10/2017	**Condition category** Cancer	

Plain English summary of protocol
Not provided at time of registration

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
N0547192949

Study information

Scientific Title
A pilot study to determine the effect of dietary intervention on novel biomarkers of breast cancer risk

Study objectives
The aim of the study is to determine the effect of dietary soy and selenium supplementation on the metabolic profile of blood and urine samples in premenopausal women at moderate-high risk of developing breast cancer.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Norfolk Research Ethics Committee, 03/04/2007

Study design
Randomised controlled pilot study

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Hospital

Study type(s)
Prevention

Participant information sheet
Not available in web format, please use the contact details below to request a patient information sheet.

Health condition(s) or problem(s) studied
Cancer: Breast

Interventions
The study will be led by Prof Aedin Cassidy, School of Medicine, Health Policy and Practice (MED) at the University of East Anglia in collaboration with Mr Simon Pain, Consultant Breast Surgeon at the Norfolk and Norwich University Hospital.

Study Outline
A flowchart of the study outline can be found in the protocol. This is a pilot study with the aim of determining the effect of dietary soy and selenium supplementation on the metabolic profile of blood and urine samples in premenopausal women at moderate-high risk of developing breast cancer. The results of this study will be used to justify and optimise larger scale intervention trials and ultimately to develop appropriate dietary recommendations for the prevention of

breast cancer. A pilot dietary intervention study based on a randomised double-blind parallel design will be conducted in 30 pre-menopausal women (age 35-50) at moderate to high risk of developing breast cancer. Study participants will be recruited from the breast clinic at NNUH and will be eligible for recruitment onto the study if they have one or more of the medium or high risk family histories as defined by the NICE guidelines (May 2004).The study involves assessing urinary and plasma metabolic profiles collected at baseline and after dietary intervention of approximately one month (one menstrual cycle, ranging between 25-35 days).

Participants will be randomised into either a placebo group (15 subjects) consuming 6g non-supplemented 'control' chocolate per day, or a supplementation group (15 subjects) consuming 6g chocolate (produced and donated by Nestle, Switzerland) containing a combination of soy (50mg as soy protein isolate) and selenium (200ug in the form of MSC).

Metabolomic profiling of blood and urine samples will be undertaken using 1H NMR and HPLC /MS techniques at the Institute of Food Research. Serum markers of soy (isoflavone analysis) and selenium status (plasma selenium, glutathione peroxidase) will be assessed at baseline and post-supplementation using a range of analytical techniques. In addition, recently proposed novel biomarkers of breast cancer risk, insulin-like growth factor-1 (IGF-1) and insulin-like growth factor binding protein-3 (IGFBP-3) will also be measured at both time points.

Specific Information
Pre-intervention (baseline) samples: Volunteers will attend the IFR, Human Nutrition Unit to provide a fasting (8hour) 20ml baseline blood sample . This blood sample and subsequent post-intervention samples will be collected during the luteal phase (time between ovulation and the start of menstruation) of the menstrual cycle, as the metabolic profile is likely to vary through different phases of the menstrual cycle in response to hormonal changes. For two days prior to blood sampling all volunteers will be asked to keep a household measures diary of all food and drink consumed during this 48hour period. A diary and full instructions will be supplied to the volunteers for this purpose. On the second day of dietary recording (day prior to blood sampling) volunteers will be asked to complete a 24 hour urine collection.

Post-intervention sampling: Following the dietary intervention period of one menstrual cycle (25-35 days depending on cycle length), a 20ml fasting blood sample will again be taken in the HNU. In order to collect pre- and post-intervention blood and urine samples at the same phase of the menstrual cycle, each volunteer will be asked to report their usual cycle length at the start of the study. Note: volunteers will only be recruited onto the study if they have regular periods and the length of their menstrual cycle is between 25-35 days. For the two days prior to this post-intervention blood sampling the volunteers will be asked to repeat the same dietary intake as consumed prior to the baseline blood sampling. The women will be re-supplied with a copy of their pre-intervention diary as a reminder of their food consumption and will also be asked to record if they eat anything differently from the pre-intervention record. Volunteers will also be asked to undertake a 24 hour urine collection on the day before blood sampling. Analysis of blood and urine samples will be identical to the pre-intervention analyses.

Dietary Intervention: Following collection of the baseline samples, volunteers will be randomly assigned to either of two intervention groups (15 per group). This is a double blind study so both the study team and volunteers will be unaware of their group allocation:

Control group: The group will be asked to consume approximately 6g of 'placebo' chocolate (approx. one square) each day for the intervention period. The chocolate will be manufactured and supplied free of charge to the study by Nestle, Switzerland. The chocolate portions will be supplied to the volunteers coded and individually wrapped.

Supplement group: This group will receive chocolate also supplied by Nestle, which will be identical in appearance to the control group, but will be supplemented with both selenium (200ug in the form of MSC) and isoflavones from soy (50mg of soy protein isolate).

As a measure of compliance all volunteers will be supplied with a record sheet to note down they time they consumed the chocolate each day.

Intervention Type
Supplement

Primary outcome measure
Measurement of urinary and plasma metabolic profiles.

Secondary outcome measures
Added 15/05/2008:
1. To quantify selenium status by measuring plasma glutathione peroxidase and selenium concentrations before and after dietary supplementation with selenium-methylselenocysteine (MSC)
2. To measure the plasma appearance of a range of isoflavone phytoestrogens (genistein, daidzein, glycitein, equol and O-desmethylangolensin) following dietary supplementation with soy protein isolate
3. To quantify insulin-like growth factor-1 (IGF-1), insulin-like growth factor binding protein-3 (IGFBP-3), collagen type I and collagen type IV concentrations in plasma/serum (biomarkers recently reported to be associated with breast cancer risk) pre- and post dietary intervention

Overall study start date
01/02/2007

Completion date
01/08/2008

Eligibility

Key inclusion criteria
Pre-menopausal women (age 35-50) at moderate to high risk of developing breast cancer. Study participants will be recruited from the breast clinic at NNUH and will be eligible for recruitment onto the study if they have one or more of the medium or high risk family histories as defined by the NICE guidelines (May 2004).

Participant type(s)
Patient

Age group
Adult

Sex
Female

Target number of participants

It is planned that 30 participants will complete the study. Allowing for an estimated dropout rate of 20%, approx 38 women may be recruited.

Key exclusion criteria
Added 15/05/2008:
1. Current or previous diagnosis of breast cancer as defined by invasive ductal carcinoma or invasive lobular carcinoma
2. Current or previous diagnosis of cancer or metastases at any site other than breast
3. Diagnosis of hypertension requiring active treatment or diabetes
4. Coronary heart disease
5. Gastrointestinal disease (or other systemic disease requiring active treatment)
6. Regularly taking any prescribed medication that may affect the study data
7. Currently taking oral contraceptives or fitted with a hormone releasing device or coil
8. Pregnant or lactating in the previous 12 months or regularly using antacids or laxatives (at least once a week).
9. Routinely taking soy or selenium supplements in the previous 12 months or regularly taking any other dietary or herbal supplements and unwilling to discontinue their use for the duration of the study
10. Participation in a selenium or soy intervention study in the previous 12 months, or parallel participation in another research study involving either dietary or medical intervention or sampling of biological fluids/materials.
11. Blood donation within 4 weeks of the first study sample and planned donation within 4 weeks of the last study sample
12. BMI <19 or >35
13. Allergy to chocolate/dairy food products or to soy or soy-based food products

Date of first enrolment
01/02/2007

Date of final enrolment
01/05/2008

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
University of East Anglia
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Sponsor information

Organisation
Record Provided by the NHSTCT Register - 2007 Update - Department of Health

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Funder(s)

Funder type
Government

Funder Name
East Norfolk and Waveney Research Consortium (Norfolk & Norwich UH/ Norwich PCT/James Paget/NWMHP) - UK

Funder Name
Norfolk & Norwich Internal Funding

Results and Publications

Publication and dissemination plan
Not provided at time of registration

Intention to publish date

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Not provided at time of registration