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Maternal vItamin D osteoporosis study

Submission date
25/02/2008

Recruitment status
No longer recruiting

Registration date
11/04/2008

Overall study status
Completed

Last Edited
30/01/2025

Condition category
Musculoskeletal Diseases

[X] Prospectively registered

[X] Protocol

[_] Statistical analysis plan

[X] Results

[_] Individual participant data

Plain English summary of protocol

Background and study aims
Vitamin D is essential for the maintenance of strong bones. It is made in the skin through the action of sunshine with very little coming from the diet. In previous studies we have found that mothers who have low levels of vitamin D in pregnancy have children born with reduced bone mass and who have weaker bones when they are older. Given that low levels of vitamin D are relatively common in the population, we are now aiming to see whether supplementing women with vitamin D during pregnancy will lead to an improvement in the bone growth of the child whilst in the womb.

Who can participate?
We are enrolling women who come to the local maternity hospital for the initial dating or screening ultrasound scan at around 11 weeks pregnancy. Most women who are 18 years or older and are only carrying one baby are eligible; those who already have bone conditions or other serious illnesses are not appropriate for the study.

What does the study involve?
The women receive information about the study with their appointment for the ultrasound scan and a research nurse approaches them after they have had the scan to see if they would like to take part in the study. If they do, then a blood sample is taken to check their vitamin D level. If this comes back in the low-normal range, they return at 14 weeks pregnancy for an assessment of diet, lifestyle, body build and for a further reference vitamin D blood test. At this point they are randomly allocated to receive either vitamin D supplements (1,000 units daily) or a matched dummy (placebo/control) tablet. Neither they nor the research staff or study leaders know which they are taking. This treatment is continued for the duration of pregnancy until the baby is delivered. The women undergo a further ultrasound scan at 19 weeks as they would on the National Health Service (NHS) system, and are assessed again at 34 weeks with a repeat of the 14-week visit. When the baby is delivered, the attending midwives let the study team know and the baby has body measurements before it leaves hospital. We also collect blood from the umbilical cord. The babys bone size and density are measured using a DXA scan (a type of scanner that is used to assess older people for osteoporosis). We then follow up with the children at a yearly visit for body measurements and assessment of health and then at four years, a repeat bone density scan.

What are the possible benefits and risks of participating?
There are unlikely to be any side effects from this dose of vitamin D and participants, depending on the study centre, may benefit from their antenatal visits being in dedicated research centres.

Where is the study run from?
Southampton and other recruitment centres are in Sheffield and Oxford (UK).

When is the study starting and how long is it expected to run for?
The study commenced in September 2008 and the last participant is expected to be recruited during the latter part of 2012.

Who is funding the study?
Arthritis Research UK, Medical Research Council and BUPA Foundation.

Who is the main contact?
Dr Nicholas Harvey
nch@mrc.soton.ac.uk

Study website
https://www.mrc.soton.ac.uk/web2/cohorts/mavidos-maternal-vitamin-d-osteoporosis-study/

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
1.5; 001-0002

Study information

Scientific Title
A randomised double-blind placebo-controlled trial of vitamin D supplements for pregnant women with low levels of vitamin D in early pregnancy

Acronym
MAVIDOS

Study objectives
To test the hypothesis that vitamin D supplementation during pregnancy of women who have low levels of vitamin D will result in improved neonatal bone mineral content.

This trial is carried out by the MRC Epidemiology Resource Centre (http://www.mrc.soton.ac.uk).

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 03/12/2007, Southampton and Southwest Hampshire Research Ethics Committee (Temple Quay House, Bristol, BS1 6PN, United Kingdom; +44 (0)2071048276; hampshirea.rec@hra.nhs.uk), ref: 07/H0502/113

Study design
Multi-centre randomized double-blind placebo-controlled trial in two phases (pilot and main studies)

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Not specified

Study type(s)
Prevention

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

Health condition(s) or problem(s) studied
Osteoporosis

Interventions
This trial comprises pilot and main studies:

Pilot study for the first 18 months, three groups of 60 participants each (total number of participants = 180):
Group 1: 400 iu vitamin D3 (oral) per day, from 14 weeks gestation to delivery

Group 2: 1,000 iu vitamin D3 (oral) per day, from 14 weeks gestation to delivery
Group 3: Placebo, from 14 weeks gestation to delivery

Main study will be vitamin D3 (dose chosen from pilot), from 14 weeks gestation to delivery vs placebo. 954 participants will be included in the main trial, 477 participants in each of the two arms (total number of participants = 954). The participants in the main trial vitamin D3 arm will include those who have participated in the pilot phase of the trial at the dose to be used in the main study i.e. 60 participants in the pilot study (either the 400 iu vitamin D3 or 1,000 iu vitamin D3 arm) will be included in the main study, and 894 new participants (954 - 60) will be recruited specifically for the main trial.

Intervention Type
Supplement

Phase
Not Specified

Drug/device/biological/vaccine name(s)
Vitamin D

Primary outcome measure
Neonatal whole body bone area, bone mineral content and bone mineral density assessed by dual energy x-ray absorptiometry (DXA) within 10 days of birth.

Secondary outcome measures
Current secondary outcome measures as of 14/06/2023:
1. Neonatal and childhood anthropometry and body composition (weight, length and skinfold thickness measurements), assessed within 48 hours of birth
2. Women's attitude to pregnancy vitamin D supplementation (qualitative study; assessed in main study only). Methodology and timepoints of assessment not yet defined as of 03/03/2008
3. Childhood bone mass at 4 years
4. Childhood bone mass, bone microarchitecture and grip strength at age 6-7 years
5. Offspring anthropometry and musculoskeletal health measured using a DXA scan, High-resolution peripheral quantitative computed tomography (HR-pQCT), grip strength, jumping mechanography and biochemical parameters (including metabolomics, 25(OH)D, bone turnover markers) at age 11-14 years

Previous secondary outcome measures:
1. Neonatal and childhood anthropometry and body composition (weight, length and skinfold thickness measurements), assessed within 48 hours of birth
2. Women's attitude to pregnancy vitamin D supplementation (qualitative study; assessed in main study only). Methodology and timepoints of assessment not yet defined as of 03/03/2008
3. Childhood bone mass at 4 years

Overall study start date
01/05/2008

Completion date
01/12/2016

Eligibility

Key inclusion criteria
1. Less than 19 weeks gestation at first assessment (based on last menstrual period [LMP] and dating scan)
2. Serum 25(OH)-vitamin D concentration is 25-100 nmol/l at nuchal fold/ dating scan (10 to 19 weeks gestation)
3. Aged over 18 years
4. Singleton pregnancy
5. Aiming to give birth at local hospital

Participant type(s)
Patient

Age group
Adult

Lower age limit
18 Years

Sex
Female

Target number of participants
1,074

Key exclusion criteria
1. Known metabolic bone disease
2. Current medication likely to interfere with intrauterine growth (corticosteroids, anticonvulsants, parathyroid hormone [PTH], bisphosphonates)
3. Foetal physical anomalies on the 12 week scan
4. Inability to provide informed consent or comply with trial protocol
5. History of renal stones, hyperparathyroidism, hypercalcuria
6. Measured hypercalacemia (>2.75 mmol/l)
7. A diagnosis of cancer in the last 10 years
8. Cod liver oil of vitamin supplements containing vitamin D >200 iu per day
9. In-vitro fertilisation treatment

Date of first enrolment
01/05/2008

Date of final enrolment
01/12/2012

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
Southampton General Hospital
Southampton
United Kingdom
SO16 6YD

Sponsor information

Organisation
Southampton University Hospitals NHS Trust (UK)

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Sponsor type
Hospital/treatment centre

Website
http://www.suht.nhs.uk

ROR
https://ror.org/0485axj58

Funder(s)

Funder type
Charity

Funder Name
Arthritis Research Campaign (ref: 17702) (UK)

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

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	07/02/2012		Yes	No
Results article	results	01/05/2016		Yes	No
Results article	results	01/01/2017		Yes	No
Results article	results	01/02/2019	28/05/2020	Yes	No
Results article	results	23/07/2021	27/07/2021	Yes	No
Results article	post hoc analysis	28/12/2022	14/06/2023	Yes	No
Results article	prespecified, 4-year follow up of offspring	11/06/2022	14/06/2023	Yes	No
Results article	risk of infantile atopic eczema	03/08/2022	14/06/2023	Yes	No
Results article	maternal blood pressure	30/01/2025	30/01/2025	Yes	No