ISRCTN32921044 https://doi.org/10.1186/ISRCTN32921044

Supplementation of vitamin B12 in young men and women, pre-conception, improves the B12 status of their newborns

Submission date
14/09/2012

Recruitment status
No longer recruiting

Registration date
01/11/2012

Overall study status
Completed

Last Edited
21/09/2021

Condition category
Nutritional, Metabolic, Endocrine

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
Research has suggested that the growth and development of the baby in the womb is an important factor in determining future health and risk of disease. This idea is called fetal programming. The mother's nutritional status has a major role to play in this programming. Our previous study demonstrated that maternal nutrition is important for the baby's growth, and micronutrients (vitamins and minerals) seem to be more important than macronutrients (calories, fat and protein). Vitamin B12 deficiency in pregnancy is common in Indian women, is caused mainly by low dietary intake of vitamin B12, and can be corrected using small daily doses of vitamin B12 capsules. The aim of this study is to find out whether B12 supplementation of young women and men improves the vitamin B12 status, birth weight, body composition, and diabetes risk of their children.

Who can participate?
All adolescents aged 16-18 years who took part in the Pune Maternal Nutrition Study.

What does the study involve?
The participants are randomly allocated to receive a daily dose of either vitamin B12 capsules, capsules containing multiple vitamins including vitamin B12, or placebo (dummy) capsules containing no vitamins. Iron and folic acid tablets are also given to all participants as per the current public health policy of the Indian government. In addition to vitamin treatment the participants are also given milk protein supplements in form of cookies or a drink. The multiple vitamins capsule group receive additional protein compared to the other two groups. The study lasts for three years. Participating girls continue to receive the treatment until their first baby is born, whereas the treatment for the boys is stopped when their wives become pregnant. The children born to these young men and women are studied at birth and later to measure their growth and diabetes risk.

What are the possible benefits and risks of participating?
We do not expect any adverse events due to the supplementation. The safety of the treatment and compliance will be monitored by monthly visits of the field staff, and any adverse events would be investigated by a medical officer.

Where is the study run from?
King Edward Memorial Hospital And Research Centre (India)

When is study starting and how long is it expected to run for?
February 2012 to September 2015.

Who is funding the study?
Indian Council for Medical Research and the Medical Research Council, UK.

Who is the main contact?
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Contact information

Type(s)
Scientific

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Additional identifiers

ClinicalTrials.gov (NCT)
NCT03088189

Protocol serial number
CTRI 2012/12/003212

Study information

Scientific Title

Maternal vitamin B12, folate and homocysteine as determinants of inter-generational programming of diabesity: the Pune Intervention Study

Acronym
PIS

Study objectives
Intervention in adolescents to improve their vitamin B12 status would improve vitamin B12 status of the offspring and potentially interrupt the intergenerational transmission of diabetes risk in the next generation.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethics Committee King Edward Memorial Hospital Research Centre, Pune, 17/01/2012, ref: KEMHRC/VSP/Dir. Off/EC/ 2465

Primary study design
Interventional

Study design
Randomised double-blind placebo-controlled single-centre trial

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Nutrition and developmental origins of health and disease

Interventions
The three intervention groups are as follows:
1. Vitamin B12 capsules - 1.0 µg
2. Multiple micronutrients capsules:
Vitamin A - 300 µg
Vitamin D - 200 IU
Vitamin E - 5 mg
Vitamin C - 20 mg
Vitamin B1 - 0.75 mg
Vitamin B2 - 0.9 mg
Vitamin B3 - 10 mg
Vitamin B6 - 1 mg
Vitamin B12 - 1.0 µg
Zinc - 6 mg
Copper - 1 mg
Selenium - 20 µg
Iodine - 75 µg
3. Placebo capsules

Daily protein supplement (drink or biscuits etc)
1. Minimal milk protein
2. About 5 gm of additional milk protein/day
3. Minimal milk protein

Iron (100mg), Folic acid (500mcg) tablets to all 3 groups will be provided as per the Government of India Guidelines.
Dose of capsules: 2 capsules per day
Duration: 3 years or delivery of the first child, whichever is earlier
Duration of follow-up: Until four weeks after delivery of the first child

Intervention Type
Other

Phase
Not Applicable

Primary outcome(s)
Umbilical cord blood measurement of vitamin B12 concentration

Key secondary outcome(s)
Birth weight and neonatal body composition (by anthropometric measurements)

Completion date
30/09/2015

Eligibility

Key inclusion criteria
1. Adolescents in the Pune Maternal Nutrition Study (boys and girls)
2. Who are not pregnant
3. Who agree to participate (assent) in the study
4. Whose parent/s give informed written consent

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
557

Key exclusion criteria

1. Plasma vitamin B12 concentration <100pmol/L
2. Haemoglobin concentration <7g/dL
3. Severe developmental disability likely to interfere with marriage and reproduction
4. Serious systemic illness (that would prohibit participation in any clinical trial, e.g. malignancy, reproductive system disorder leading to infertility, congenital or acquired cardiovascular disease with New York Heart Association (NYHA) Functional Classification III or IV)
5. Treatment with drugs interfering with one-carbon metabolism [e.g. folate antagonists: phenytoin, valproic acid, carbamazepine, trimethoprim, methotrexate; B12 antagonists: metformin, Proton-pump inhibitors (PPIs)]
6. Treatment with hematinics (containing B group of vitamins) for more than 30 days

Date of first enrolment
09/02/2012

Date of final enrolment
01/07/2012

Locations

Countries of recruitment
India

Study participating centre
King Edward Memorial Hospital And Research Centre
Pune
India
411011

Sponsor information

Organisation
King Edward Memorial Hospital Research Centre (India)

ROR
https://ror.org/056yyyw24

Funder(s)

Funder type
Research council

Funder Name

Indian Council of Medical Research (India) ref: 58/1/8/MRC-ICMR/2009/NCD-II

Alternative Name(s)
Indian Council of Medical Research, Government of India, Indian Council of Medical Research (ICMR), New Delhi, ICMROrganisation, , Indian Council of Medical Research, New Delhi, ..., ICMR, ICMRDELHI, ...

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
India

Funder Name
Medical Research Council (MRC) (UK) ref: MR/J000094/1

Alternative Name(s)
Medical Research Council (United Kingdom), UK Medical Research Council, Medical Research Committee and Advisory Council, MRC

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article	protocol	08/05/2017	15/10/2020	Yes	No
Preprint results	non-peer-reviewed results	13/09/2021	21/09/2021	No	No