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Evaluation of vitamin B12 supplementation on nutritional status in vegan and vegetarian subjects

Submission date
04/04/2017

Recruitment status
No longer recruiting

Registration date
28/04/2017

Overall study status
Completed

Last Edited
15/08/2022

Condition category
Nutritional, Metabolic, Endocrine

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

Plain English summary of protocol

Background and study aims
The vegetarian diet, or the stricter vegan diet, requires particular attention to any deficiency (shortage) in certain nutrients. In particular, vitamin B12 is present exclusively in animal products and is involved in many important reactions in the body. Vegans that exclude animal products from their diet may incur in a deficient nutritional status. The deficiency in the long term may lead to the onset of anemia (low blood iron) and neurological problems (issues with the brain, spine and nerves), as well as effects on the immune system (ability to fight off illness), hyperhomocysteinemia (an elevation of an amino acid in the blood that is linked to heart disease) and cognitive (mental) decline. In a situation where you people are unable to get enough B12 it is normal take supplements such as tablets that contain the nutrient. The aim of this study is to investigate the effect of the consumption of two different dosages (a high dose and a low dose) of vitamin B12 supplement sublingual tablets (a tablet that is inserted beneath the tongue to dissolve) in people with a marginal (low) deficiency.

Who can participate?
Vegan and vegetarian healthy adults aged 20-60 years old with a vitamin B12 deficiency.

What does the study involve?
Participants undergo a medical examination and complete questionnaires to determine eligibility. They are then randomly allocated to one of two groups. Those in the first group receive a low dose (350mcg/week) of a B12 dietary supplement (a tablet) that they take daily for three months. Those in the second group receive a high dose (2000mcg/week) of a vitamin B12 dietary supplement (a tablet) that they take weekly for three months (they take placebo pills the other six days of the week). Participants are followed up with blood samples before the study and at day 15, 30, 60 and 90 to monitor their nutritional levels and assess the concentration of the vitamin in their blood.

What are the possible benefits and risks of participating?
Participants may benefit from the expected improvement of vitamin B12 nutritional status. There is a slight risk of temporary headaches, balance problems or vision disorders associated with high dose supplements.

Where is the study run from?
University of Milano Department of Food, Environmental and Nutritional Sciences (Italy)

When is the study starting and how long is it expected to run for?
March 2015 to April 2017

Who is funding the study?
Phoenix SRL (Italy)

Who is the main contact?
1. Professor Salvatore Ciappellano (Scientific)
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2. Dr Antonella Brusamolino (Scientific)

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers
11/15 University of Milano - ethical comitee

Study information

Scientific Title
Evaluation of nutritional status of vitamin B12 in vegans and vegetarians with marginal deficiency after 12 weeks of supplementation with two dosages of a sublingual formulation

Acronym
NuCbl

Study objectives
Dietary supplementation with low dose of vitamin B12 sublingually administered to vegan subjects should allow the recovery of an adequate nutritional status related to vitamin B12.

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethics Committee of the University of Milan, 04/03/2015, ref: 11/15

Study design
12 week two armed dietary interventional randomised parallel trial

Primary study design
Interventional

Secondary study design
Randomised parallel trial

Study setting(s)
Community

Study type(s)
Quality of life

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
Healthy volunteers with B12 marginal deficiency

Interventions
Participants are enrolled in the study after they complete a specific questionnaire and medical examination to determine eligibility. Participants are then randomly allocated to one of two groups based on when they joined the study.

Control group (Hd- high dose): Participants are given a high vitamin B12 concentration (2000mcg /week) dietary supplement that they take weekly for three months. Supplements are given tablets that dissolve under the tongue. Participants in this group take tablets everyday but only once a week take a pill that is enriched with B12, the other six days the tablets are placebo.

Test group (Ld- low dose): Participants are given a low vitamin B12 concentration (350mcg /week) dietary supplement that they take daily for three months. Supplements are given as tablets that dissolve under the tongue and are taken daily.

Fasting blood samples (about 30 mL) are obtained from all participants, at baseline and after 15, 30, 60 and 90 days to assess Vitamin B12, holotranscobalamine, metilmalonic acid, homocysteine, folic acid, vitamin B6 and complete blood count. This is also done to monitor the modification of the nutritional status during the entire intervention.

Intervention Type
Supplement

Primary outcome measure
Nutritional status (vitamin B12, holotranscobalamin, methylmalonic and homocysteine concentrations) are measured using blood samples at baseline, day 15, day 30, day 60 and day 90

Secondary outcome measures
1. Complete blood count is measured using blood samples at baseline, day 15, day 30, day 60 and day 90
2. Serum levels of folic acid is measured using blood samples at baseline, day 15, day 30, day 60 and day 90
3. Vitamin B6 is measured using blood samples at baseline, day 15, day 30, day 60 and day 90

Overall study start date
12/02/2014

Completion date
10/04/2017

Eligibility

Key inclusion criteria

1. Healthy men/women (20-60 years of age)
2. Moderate smoking (about 5-6 cigarette/day)
3. Moderate physical activity (25-30 min per day of brisk walk or jog)
4. Moderate alcohol consumption (up to 14 drinks per week)
5. Plasma levels of vitamin B12 lower than 220 pmol / L
6. Follow a vegan diet
7. No regular intake of drugs (for any type of disease)
8. Non allergic subjects

Participant type(s)
Healthy volunteer

Age group
Adult

Sex
Both

Target number of participants
At least 40 subjects

Total final enrolment
40

Key exclusion criteria
1. History of cardiovascular, coronary, diabetes, hepatic, renal, or gastrointestinal diseases.
2. Use of any drugs, medications at least one month before the beginning of the experiment.
3. Use of vitamin B12 supplements at least one year before the beginning of the experiment.
4. Omnivore subjects

Date of first enrolment
05/05/2015

Date of final enrolment
04/12/2016

Locations

Countries of recruitment
Italy

Study participating centre
University of Milan
Department of Food, Environmental and Nutritional Sciences
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Sponsor information

Organisation
Phoenix S.R.L. - LongLife Nutritional Supplements

Sponsor details
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Sponsor type
Industry

Website
www.longlife.it

Funder(s)

Funder type
University/education

Funder Name
University of Milan

Funder Name
Phoenix S.R.L. - LongLife Nutritional Supplements

Results and Publications

Publication and dissemination plan
Planned publication in a high-impact peer reviewed journal. Expected participation in conferences and public events to present the results.

Intention to publish date

31/12/2017

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are/will be available upon request from Salvatore Ciappellano salvatore.ciappellano@unimi.it

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/04/2019		Yes	No
Results article	Association of cobalamin and vascular endothelial-cadherin in trial participants	16/07/2022	15/08/2022	Yes	No