

The influence of hypovitaminosis D on iron deficiency in healthy women

Submission date 21/09/2017	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered
		<input type="checkbox"/> Protocol
Registration date 09/10/2017	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan
		<input type="checkbox"/> Results
Last Edited 03/10/2017	Condition category Nutritional, Metabolic, Endocrine	<input type="checkbox"/> Individual participant data
		<input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

Hypovitaminosis D (a deficiency in Vitamin D, a nutrient that comes from sunlight) has been associated with anemia in patients with chronic diseases and also in healthy populations. One of the explanations for this association is the action of vitamin D on iron metabolism, which influences the absorption and mobilisation of iron, mainly through inflammatory mechanisms. It is not yet known if vitamin D could directly influence the body iron storage. The aim of this study was to verify the correlation between vitamin D levels and body iron store in a population of healthy adult women.

Who can participate?

Women aged 18 and older with chronic diseases.

What does the study involve?

Participants are measured for their body iron content and their vitamin D levels measured which is retrieved from a public database. The data is then analysed using a statistical model.

What are the possible benefits and risks of participating?

There are no benefits or risks with participating.

Where is the study run from?

Instituto De Medicina Integral Professor Fernando Figueira (Brazil)

When is the study starting and how long is it expected to run for?

November 2016 to December 2016

Who is funding the study?

Investigator initiated and funded (Brazil)

Who is the main contact?

Mrs Daneily Barbosa
danycariry@hotmail.com

Contact information

Type(s)

Public

Contact name

Mrs Daniely Barbosa

Contact details

Rua Arlindo Gouveia

145

2502b

Recife

Brazil

50720595

+55 819 883 73784

danycariry@hotmail.com

Additional identifiers

Protocol serial number

Plataforma Brasil. CAAE: 60849916.3.0000.5201

Study information

Scientific Title

Influence of vitamin D on body iron store in healthy women from NHANES: a cross-sectional study using an econometric model of causal inference

Study objectives

Hypotheses:

1. Vitamin D levels have a positive correlation with body iron content in women.
2. Positive correlation functions between vitamin D levels and body iron content differ according to age, race, menstrual status and levels of parathyroid hormone.
3. Vitamin D has a cause-effect relationship on body iron content.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Ethics Committee on Research in Human Beings of the Institute of Integral Medicine, 05/12 /2016, ref: Record number: 60849916.3.00005201

Study design

A cross-sectional population-based study

Primary study design

Observational

Study type(s)

Other

Health condition(s) or problem(s) studied

Hypovitaminosis D and iron deficiency

Interventions

The study is cross-sectional study. Participants have the variables of interested measured. This includes measurements for body iron content (calculated using Cook's formula) and 25hydroxivitamin D levels. There is no follow up. The data is retrieved from NHANES public datasets, which includes laboratory information of interest: levels of RsTf (soluble transferrin receptor), ferritin and 25hydroxivitamin D. No sample size calculation was performed, choosing to use all the observations that met the selection criteria in the years 2003-2004 and 2005-2006.

Statistical analysis:

A predictive multivariate theoretical model, with Body Iron Store as dependent variable and 25 hydroxivitamin D as the predictive variable is designed. Statistical strategy to select covariables is not used, choosing, instead, saturated models that aim to estimate the coefficient of the predictive variable adjusted for the largest possible number of confounders. The following confounding covariables are: age, race, educational level, annual family income (USD/year), menstrual status, body mass index (BMI) (kg/m²), albumin level (g/dL), CRP level (mg/dL) and parathyroid hormone (PTH) level (pg/mL).

Initially, a simple linear regression model (Ordinary Least Squares – OLS) is used to evaluate the β coefficient of the correlation between 25OHD and BIS, which is then adjusted for sociodemographic, clinical, and laboratory covariables in a multiple linear regression model. For the evaluation of the possible effect modifiers, the model was stratified according to the subgroups of iron-sufficient and iron-deficient women. Next, vitamin D interaction terms, with age, race, PTH and menstrual status, are added, which are included in the multivariate models as products of 25OHD and each of these covariables.

Then, to access causal inference, we chose the econometric model proposed by Lewbel to identify the effect of endogeneity on dose-response correlation coefficients. According to the econometric rationale, if we can mathematically rule out the endogeneity bias, we can perform a causal inference.

Intervention Type

Other

Primary outcome(s)

Vitamin D levels in correlation with body iron stores (BIS) are measured using patient data and a predictive model.

Key secondary outcome(s)

There are no secondary outcome measures.

Completion date

31/12/2016

Eligibility

Key inclusion criteria

1. Women older than 18 years old
2. Who did not have chronic diseases
3. In whom the results of 25-hydroxyvitamin D (25OHD)
4. Soluble transferrin receptor (sTfR)
5. Ferritin levels available
6. Chronic diseases as defined as the following a self-report of cancer, heart failure, pulmonary emphysema, chronic bronchitis, gastric or intestinal diseases; changes in laboratory markers of liver disease (aspartate aminotransferase greater than 121 U/L, alanine aminotransferase greater than 128 U/L and total bilirubin greater than 2.1 mg/dL) or renal disease (creatinine greater than 1.5 mg/dL); and the presence of a HIV-positive serology.

Participant type(s)

Healthy volunteer

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

Female

Key exclusion criteria

1. Women who reported undergoing iron supplementation in the last 3 months
2. Who had a positive pregnancy test or changes in the markers of malnutrition (albumin < 3.5 g/dL)
3. Inflammation (C-reactive protein (CRP) > 5.0 mg/dL) or iron overload (transferrin saturation > 45%)

Date of first enrolment

01/01/2017

Date of final enrolment

31/08/2017

Locations**Countries of recruitment**

Brazil

United States of America

Study participating centre

Instituto De Medicina Integral Professor Fernando Figueira
R. dos Coelhos, 300 - Boa Vista
PE
Recife
Brazil
50070-550

Sponsor information

Organisation

Instituto De Medicina Integral Professor Fernando Figueira

ROR

<https://ror.org/01rtyyz33>

Funder(s)

Funder type

Other

Funder Name

Investigator initiated and funded

Results and Publications

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study are/will be available upon request from Daniely Sobreira Cariry Barbosa (danycariry@hotmail.com)

IPD sharing plan summary

Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes