Is use of medication associated with blood levels of micronutrients?

A cross-sectional study of a geriatric population of hospital Gelderse Vallei

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Introduction

Vitamin B12 and vitamin D deficiency are common in elderly people. Estimates for different populations suggest prevalences of about 20% and 50-80% respectively.

Micronutrient deficiencies may result in serious health problems which can be treated or prevented if recognized in time. A well-known example is metformin-induced neuropathy, caused by vitamin B12 deficiency, which can be mistaken for the irreversible diabetic neuropathy.

Causes of deficiencies are several. Also medication might be a contributing factor, but knowledge about drug-nutrient associations is far from complete.

Objective

Main objective of this cross-sectional study is to investigate associations between use of medication and micronutrient blood levels in a geriatric outpatient population of the Dutch hospital Gelderse Vallei in Ede.

We focus on vitamin B12 and vitamin D blood levels. Medications of interest are metformin next to the four most frequently used drugs in the study population: proton pump inhibitors, beta blockers, statins and ACE inhibitors. Furthermore, we will give an overview of prevalences of the micronutrients vitamin B12, vitamin D, vitamin B1, vitamin B6, folic acid, sodium, potassium and calcium.

Methods

Literature search
Subject: associations between use of drugs and micronutrient blood levels
Database: PubMed

Cross-sectional study
Study population: 512 geriatric outpatients of the hospital Gelderse Vallei in Ede
Data: electronic patient records
Time period: January 1st - November 15th 2011
Statistical software: SPSS 15.0
Method of data analysis: ANCOVA
Effect measure: difference between adjusted means

P-value: 2-sided

Results

90% of the patients of our study population takes one or more medications. Mean number of drugs used per geriatric outpatient is 5.6. Some details of micronutrient prevalences are illustrated in table 1.

The mean differences in micronutrient blood levels between users and non-users of a specific drug plus corresponding p-values are illustrated in table 2 and 3.

Discussion

Green coloured: results cross-sectional study; blue coloured: results literature search

Conclusion

High prevalence of vitamin D deficiency in study population
Clinical relevance of vitamin D and B12 deficiency
Possible associations between medication use and vitamin B12 and vitamin D blood levels
Polypharmacy in elderly
Reasons to continue research