Vitamin status in COPD patients

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Background

Chronically ill patients are at risk for malnutrition due to increased (energy) requirements or decreased food intake. Malnutrition may result in micronutrient deficiencies. Adequate diagnosis and treatment of micronutrient deficiencies may improve patient wellbeing. At present, the prevalence of micronutrient deficiencies in patients suffering from specific diseases is largely unknown.

Aim of the study

To explore the vitamin status in patients with chronic obstructive pulmonary disease (COPD).

Methods

- Inclusion of COPD patients aged ≥65 years with stable disease
- Exclusion criteria: use of medical nutrition, dietary counseling, renal insufficiency, oncological disease, or corticosteroid use
- Recruitment: ZGV pulmonary ward and general practitioners
- Blood sampling after written informed consent; laboratory analysis at ZGV (folate, vitamin B1, B6, B12, D) or WU (vitamin A, C, E) using standard procedures
- Statistical analyses using SPSS v22.0 software, 41 cases.

Results

Vitamin status in COPD patients

- Reference ranges for vitamin D, B6 and folate were not met in >10% of COPD patients (Table 1)
- Reference ranges for vitamin B1 and a-tocopherol were exceeded in >10% of COPD patients (Table 1)
- a-tocopherol levels were higher in females than males (30.1 versus 39.7 µmol/l, P = 0.016)

Correlation between vitamin status and disease parameters in COPD patients

- Vitamin B6 levels were inversely correlated with age (subset of 27 cases; r = -0.448, P = 0.019; Figure 1A)
- B/g tocopherol concentrations were inversely correlated with lung function (r = -0,334, P = 0.033; Figure 1B)
- No correlation found between vitamin status and body mass index (BMI), GOLD classification or Quality of Life (QoL).

Vitamin	unit	reference range	mean (SD)	< reference range (%)	> reference range (%)
B1	nmol/l	90-200	152.1 (38.5)	-	12.2
B6	nmol/l	51-186	84.2 (43.3)	19.5	2.4
Folate	nmol/l	7-40	18.0 (12.6)	12.2	9.8
B12	pmol/l	150-500	322.4 (189.9)	2.4	7.3
D	nmol/l	75-250	70.7 (32.4)	56.1	-
Retinol	µmol/l	1.2-2.6	2.1 (0.6)	2.4	9.8
a-tocopherol	µmol/l	15-35	33.4 (12.2)	2.4	34.1
b/g-tocopherol	µmol/l	-	2.0 (0.6)	-	-
C	µmol/l	11-100	36.8 (19.8)	9.8	-

Table 1: Overview of vitamin status in COPD patients

Figure 1A: Correlation between vitamin B6 concentration and age in COPD patients.

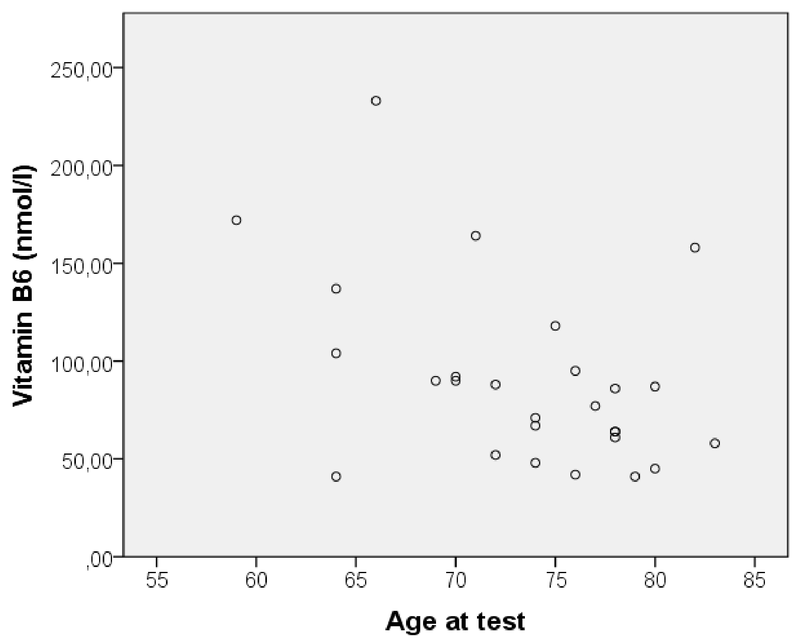
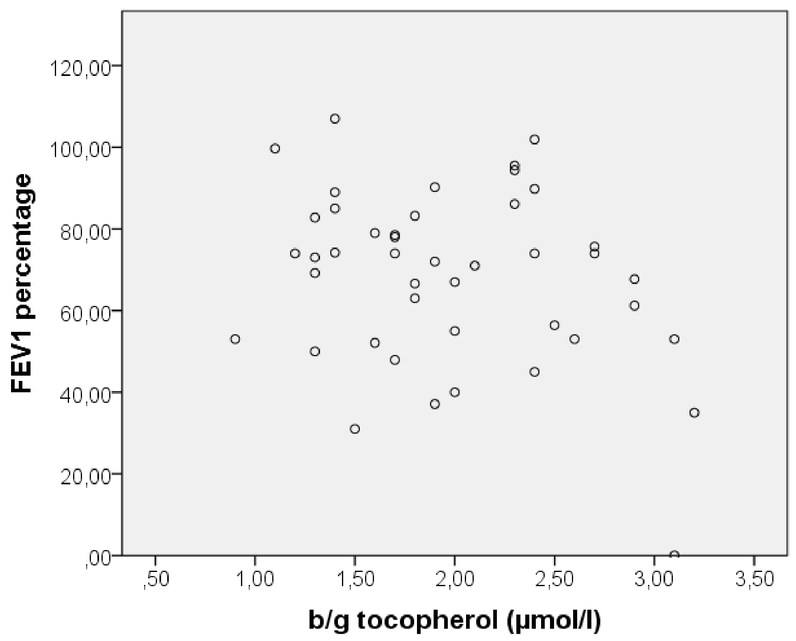


Figure 1B: Correlation between b/g tocopherol concentration and % forced expiratory volume in 1 second (FEV1%) in COPD patients.



Conclusions

Deficiencies for vitamin D, B6 and folate are present in COPD patients. No correlations between vitamin status and COPD stadium, BMI or QoL were observed.