Screening of subjects at risk of severe vitamin D deficiendy: a clustering approach

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tion, but not all of them corrected for physical activity or body fatness, thus assumingly overestimating the association between vitamin D and physical function. There is some evidence from intervention studies that vitamin D supplementation might improve physical function in old adults. However, the heterogeneity of studies in older adults carried out to date has made it difficult to draw conclusions from their results.

Objectives: In order to get more knowledge on vitamin D and physical function, the present analysis investigated the associations between both serum 25-OH vitamin D status as well as dietary vitamin D intake with gait speed in community dwelling old adults with particular consideration of body fatness and physical activity.

Method / Design: Community living volunteers (N=236, 73.7±5.7 years, 58.2% female) were from the Greater Reykjavik Area and dietary intake (3 day food record), body composition and blood chemical variables (25-OH vitamin D) were measured.

Results: The majority of the participants reported regular leisure-time physical activity and two-thirds of those reached the recommended level of 30 minutes per day. The most frequent activities were outdoor walking (70.1%), outdoor swimming (37.9%) and indoor group based exercise for older adults (33.2%). Average serum 25-OH vitamin D levels were well above the commonly used lower reference of 50 nmol/L or about 67 ± 28 nmol/L.

Conclusions: In this cross-sectional analysis we found associations between dietary vitamin D, serum 25-OH vitamin D status and gait speed in community dwelling old adults. However these were not independent and mostly explained by the confounding of BMI and physical activity. Interestingly, this was true for both dietary vitamin D and vitamin D blood status.

Keywords: (maximum 5): Vitamin D, 6 minute walking distance, elderly

149/502. Outdoor physical activity, fish oil and vitamin D in older Icelandic adults.

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Introduction: In Nordic countries dietary vitamin D intake is regarded as particular important, because vitamin D synthesis in skin is limited due to long winters and cold summer allowing only little sun exposure.

Objectives: The aim of the present analysis was to investigate the associations between (OH)D status, outdoor physical activity (OPA) and fish oil supplementation, they main dietary source of vitamin D in Iceland, in community dwelling Icelandic elderly.

Method / Design: In this cross-sectional analysis, the participants' (N=236, 65-92 years) 25(OH)D was measured. Blood sampling season was categorized into fall, winter and spring. OPA was categorized into <30 min/d and ≥30 min/d. Associations of 25(OH)D with OPA were investigated using multivariate statistics.

Results: Of the participants, 8.5% were vitamin D deficient (< 30nmol/L) and 21.5% had poor status (≥30 but <50nmol/L). Fifty-two-point-six percent used fish oil regularly which was associated with a 16.8nmol/L higher 25(OH)D (P<0.001). OPA was associated with higher 25(OH)D when blood samples were taken in fall (10.2nmol, P=0.050), but not in winter (5.0nmol/L, n.s.) or spring (-0.6nmol/L, n.s.).

Conclusions: Although OPA is associated with increased 25(OH)D in fall, this association disappears during winter months in Icelandic elderly. It is therefore of great importance for this group to rely on sufficient amounts of vitamin D from food or dietary supplements in order to maintain 25(OH)D in an appropriate range.

Keywords: (maximum 5): Physical activity, vitamin D, fish oil

149/503. Screening of subjects at risk of severe vitamin D deficiency: a clustering approach

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Introduction: Avoiding vitamin D deficiency is essential regarding several health outcomes. Systematic blood testing may represent an important economic burden and systematic supplementation could lead, in some subjects, to a very high status, with unknown long-term consequences. Therefore, it is crucial to implement easy-to-apply strategies for screening at-risk patients.

Objectives: Our objective was thus to characterize individuals at high risk of severe vitamin D deficiency (25OHD<10ng/ml).

Method / Design: A combination of hierarchical and non-hierarchical cluster analysis was performed on 1528 French Caucasian adults (45-60y) from the SU.VI.MAX cohort. The following baseline variables (collected through self-administered questionnaires and anthropometric measurements) were included in the clustering procedure: severe vitamin D deficiency (yes/no, Roche Cobas® electrochemoluminescent assay on baseline plasma samples), gender, age, BMI, physical activity, educational level, dietary intake of vitamin D, latitude, sun exposure, Fitzpatrick phototype, and month of blood draw.

Results: Two clusters were identified. Cluster 1 consisted of all participants with severe vitamin D deficiency and was characterized by the overrepresentation of: very low sun exposure, obesity, female gender, blood draw at the end of winter or early spring, Northern latitudes, irregular or low physical activity and the fairest skin phototypes. Cluster 2 consisted of all participants without severe vitamin D deficiency.

Conclusions: This study presented for the first time a clustering analysis to identify high-risk individuals for severe vitamin D deficiency. This approach, based on easy-to-assess phenotypic, sociodemographic and lifestyle characteristics, can help to improve clinical practice by better targeting patients at need for vitamin D supplementation and/or blood testing.

Keywords: (maximum 5): 25-hydroxyvitamin D; cluster analysis; severe vitamin D deficiency; clinical practice

149/505. Midlife dietary patterns and healthy aging among French adults: a prospective study

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Introduction: Multidimensional concepts referred to as "healthy aging" have recently become popular in geriatric research. These concepts aim to capture health during aging as a whole, beyond specific medical conditions or body functions. Few studies have investigated the association of diet and healthy aging.

Objectives: To investigate the association between empirically derived dietary patterns in midlife and healthy aging.

Method / Design: Baseline dietary data from repeated 24-h dietary records of a subsample of the SUpplémentation en Vitamines et Minéraux AntioXydants (SU.VI.MAX) Study permitted the extraction of dietary patterns using principal component analysis on 37 food groups. Healthy aging was assessed in 2007-2009 among 2,796 participants of the SU.VI.MAX study aged 45-60 years at baseline (1994-1995), initially free of diabetes, cardiovascular disease and cancer. Healthy aging was defined as not developing any major chronic disease, good physical and cognitive functioning, no limitations in instrumental activities of daily living, no depressive symptoms, no health-related limitations in social life, good overall self-perceived health and no function-limiting pain. The association between dietary patterns (in tertiles, T) and healthy aging was evaluated using multivariable logistic regression, and a potential interaction with energy intake was investigated.

Results: A "western" and a "healthy" dietary pattern were identified. Higher adherence to the western dietary pattern was associated with lower odds of healthy aging, but the association was attenuated when accounting for confounders. The healthy pattern was not associated with healthy aging among subjects with high energy intake. Among subjects with low energy intake on the other hand, higher scores on the healthy dietary pattern were related to higher odds of healthy aging: Odds ratio for T3 vs. T1: 1.49 (95% confidence interval=1.11, 2.00; P for trend=0.01).

Conclusions: Adherence to a healthy diet in midlife providing micronutrients, fiber and antioxidants while regulating energy intake may help to promote healthy aging.

Keywords: (maximum 5): dietary patterns, healthy aging

149/510. Price adjustment to reduce French fries consumption among university students: an on-campus restaurant experiment

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Introduction: Willingness-to-pay has been found to be a determinant of university students' (un)healthy eating behaviours. As pricing strategies are proven to be effective in other populations, price adjustments may be an effective strategy to improve students' dietary intakes.

Objectives: The purpose of this study was to examine the effect of a 10% and 20% price increase on French fries consumption among Belgian university students.

Method / Design: This pre-experimental study used a pre-post, between-subjects design to examine the effect of French fries price increases on students' French fries consumption in the on-campus restaurant of the Vrije Universiteit Brussel (with approximately 600 to 700 student visits per day). Baseline sales data were collected during a pre-intervention week. During two intervention weeks students had to pay respectively €0.5 and €1 extra (a menu normally costs €5) when choosing for French fries instead of rice or (mashed) potatoes. To control for meal bias, the same menus were provided during the pre-intervention and intervention weeks. French fries sale counts relative to the total amount of menu sales were used as the outcome measure. The Binomial test for one proportion was performed in R to analyse differences in French fries sale counts between pre-intervention and intervention weeks.

Results: In comparison to baseline sales data (52.8% of all students eating lunch at the on-campus restaurant consumed French fries), significant decreases in French fries consumption to respectively 41.9% ($p<0.001$) and 31.0% ($p<0.001$) were found during the first (10% price increase) and the second intervention week (20% price increase).