

Methods: Research guidelines, meta-analysis (MA), systematic reviews (SR) and randomized controlled trials (RCT) in English and Portuguese, in PubMed and medical databases based on evidence. MeSH terms used: "Parkinson's disease" and "osteoporosis". Articles published between January 2006 and January 2016 were selected.

Results: Four articles were obtained, but only three met the inclusion criteria. One MA, one SR and one RCT showed a relation between PD and osteoporosis, bone mineral density (BMD) and fracture risk. Patients with PD have an increased risk for osteoporosis when compared to the general population. It was also evident in PD: lower BMD, lower vitamin D levels and an increased risk of fractures. The reduction of bone mass in PD seems to be mainly caused by limited mobility. Endocrine (such as vitamin D deficiency), nutritional and iatrogenic factors also play an important role in the depletion of bone mass. Female sex, PD duration and severity, advanced age and low body mass index were associated with severe osteoporosis.

Conclusions: The available evidence supports an increased risk of osteoporosis among PD patients. This fact should alert the clinician about the importance of osteoporosis screening in PD patients. However, more studies are needed, with high methodological quality and patient oriented, in order to demonstrate the health benefit of osteoporosis screening/early treatment in PD patients.

CO10. O PAPEL DAS ORTÓTESES DE TRONCO NA OSTEOPOROSE

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Introdução: As ortóteses de tronco são um componente do tratamento conservador da osteoporose, sobretudo quando o doente desenvolve fracturas osteoporóticas. Podem ter indicação numa fase aguda, subaguda ou crónica da doença. Dada a escassez de evidência, na prática clínica ainda persistem dúvidas quanto ao tipo de ortótese mais indicado, quando se deve utilizar e durante quanto tempo.

Objectivos: Avaliar o papel das ortóteses de tronco no doente com osteoporose e as suas principais indicações.

Métodos: Revisão da literatura publicada nas principais bases de dados médicas até Março de 2016.

Resultados: De um total de 4,236 artigos inicialmente identificados, foram incluídos 12 artigos para análise mais pormenorizada. A literatura evidencia o benefício das ortóteses no controlo da dor, suporte estrutural, melhoria da postura, propriocepção e equilíbrio, contribuindo para a prevenção de deformidades e de novas fracturas osteoporóticas. Os autores descrevem as principais ortóteses de tronco utilizadas nos doentes com osteoporose, particularizando as indicações dos diferentes tipos de ortótese.

Conclusões: As ortóteses de tronco apresentam efeito benéfico significativo em certas situações clínicas. Contudo, a sua prescrição deve ser individualizada a cada doente e requer um vasto conhecimento da anatomia, biomecânica, cinesiologia e patologia. São necessários mais estudos com qualidade metodológica que sustentem a evidência do benefício das ortóteses do tronco, nomeadamente a longo prazo.

WCO01. SKELETAL MUSCLE AND VITAMIN D LEVEL IN WOMEN OF VARIOUS AGES

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Introduction: In recent years there has been a number of studies examining the correlation between vitamin D status and skeletal

muscles. However, there are many different approaches to the role of vitamin D metabolism and function of skeletal muscles.

Objectives: The aim of the research conducted at the SI «D.F. Chebotarev Institute of Gerontology NAMS of Ukraine» was to study the correlation between skeletal muscles and vitamin D level in women of different ages.

Methods: The study involved 122 healthy women aged 20 to 83 years. According to the gerontological classification, the examined women were divided into groups: younger – up to 44 years (n = 35), middle – 45-59 years old (n = 26), older – 60-74 years (n = 44), senile age – 75-89 years (n = 17). Lean mass of the total body, upper and lower extremities was evaluated using Dual X-ray absorptiometry (Prodigy, GEHC Lunar, Madison, WI, USA). Strength of skeletal muscle was evaluated using springy carpal dynamometer. To determine the functional capacity of skeletal muscle we used a «four-meter» test. To determine the level of 25(OH)D electrochemiluminescent method was used with Elecsys 2010 analyzer (Roche Diagnostics, Germany).

Results: We determined a significant correlation between parameters of lean mass (r = 0.45; t = 2.08; p = 0.05) and the level of vitamin D in women of middle (45-59 years) age; skeletal muscle functionality (r = -0.51; t = -2.29; p = 0.04) and the level of vitamin D in women of older (60-74 years) age. We did not find the significant correlation between parameters of muscle strength and level of vitamin D.

Conclusions: Significant correlation between parameters of lean mass, skeletal muscle functionality and the level of vitamin D was determined in women of middle and older age.

WCO02. PRELIMINARY RESULTS OF VITAMIN D BLOOD LEVELS IN A PORTUGUESE YOUNG ADULT POPULATION

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Introduction: The hormone "vitamin D" [25(OH)D] has been extensively studied worldwide lately, in order to try to define its adequate or inadequate blood levels and their eventual clinical significance. Although the skeletal consequences of the low levels are well known, the association with increased risk of cancer and cardiovascular diseases is far from clarified. It is known that vitamin D blood levels vary through life, but in Portugal the studies about it in different aged populations are scarce.

Objectives: To study the variation of vitamin D blood levels, through summer and winter and to relate it to biochemical and hormonal parameters, in a Portuguese young adult population.

Methods: In 268 healthy adults (190 women, 78 men), aged 18 to 35 years, fasting blood was taken to measure 25(OH)D, iPTH, calcium, phosphorus, liver and renal functions, TSH and other hormones, in summer 2014 and in the winter after. The hormones were analyzed by Liaison technology. To define abnormal 25(OH)D we used the "Endocrine Society 2011" criteria. Adequate statistical tests were used to describe the summer/winter groups and their differences. Statistical significance was considered for p < 0.05.

Results: The mean (± SD) 25(OH)D in the vitamin D groups and the n (%) in each group (table). Significant relations were found for

both 25(OH)D ($r = 0.683$; $p = 0.001$) and PTHi ($r = 0.467$; $p = 0.001$) blood levels between summer and winter.

Groups of Vitamin D ng/ml	Normal (> 30)	Insufficiency (21-29)	Deficiency (< 20)
Summer	37.0 (± 1.0)	24.7 (± 0.27)	16.9 (± 4.1)
Winter	33.2 (± 0.8)	23.4 (± 0.4)	14.3 (± 0.3)
Summer n (%)	48 (24.6)	100 (51.3)	47 (24.1)
Winter n (%)	3 (1.9)	23 (14.4)	134 (83.8)

Conclusions: Significant variations summer/winter of both 25(OH)D and iPTH blood levels, were found in this healthy young adult population. Also, the means of 25(OH)D were relatively low, suggesting that many young adults have already levels of deficiency/insufficiency, such as was described in other south European countries; however, the clinical significance of such inadequate levels still remains unclarified.

WC003. VITAMIN D, BONE MINERAL DENSITY AND TRABECULAR BONE SCORE IN MEN

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Introduction: BMD and blood vitamin D concentrations decline slowly with ageing, as falls and osteoporotic fractures increase among elderly people. The bone quality may be accessed by trabecular bone score (TBS); together, TBS and DXA may evidence bone strength. However, data about the influence of vitamin D on the TBS are scarce.

Objectives: To evaluate the influence of the blood vitamin D levels on the BMD and TBS in normal men.

Methods: The bone mineral content (BMC, g), BMD (g/cm^2), and TBS (obtained from DXA scan) at the lumbar spine were evaluated in a group of normal men aged ≥ 40 years. Fasting blood collections were performed for measurements of the osteocalcin, 25(OH)D and iPTH concentrations. These men were divided in the normal, low BMD and osteoporosis groups, as well as in the normal, insufficiency and deficiency vitamin D groups (ES Guidelines). Total body fat and lean masses were also calculated. Adequate statistical tests were used (statistical significance $p < 0.05$).

Results: Men of deficiency group were heavier and with the lower TBS. The mean (\pm SD) osteocalcin, iPTH, 25(OH)D and TBS of the BMD are shown in the table. Significant correlation coefficients were detected between the blood 25(OH)D vs weight, vs total fat mass and vs TBS but not vs BMD.

Groups variable	Normal (50.0%)	Low BMD (41.1%)	Osteoporosis (8.9%)	p
Osteocalcin ng/ml	17.6 (± 1.6)	18.8 (± 1.7)	25.7 (± 3.7)	NSD
iPTH pg/ml	46.5 (± 6.5)	61.4 (± 7.0)	60.5 (± 15.0)	NSD
25(OH)D ng/ml	20.6 (± 1.8)	20.2 (± 2.0)	18.8 (± 4.4)	NSD
TBS L1-L4	1.334 (± 0.1)	1.319 (± 0.1)	1.281 (± 0.1)	NSD

Conclusions: Blood 25(OH)D levels may play an important role on the bone quality accessed by TBS in vitamin D deficient men, as they have worse bone quality. The data suggest that more studies are needed on larger cohort of men and it might be worth to investigate also elderly men with osteomalacia.

WC004. ASSOCIATION BETWEEN SUBCLINICAL AND OVERT HYPERTHYROIDISM, VITAMIN D AND BONE DENSITY CHANGES

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Introduction: Patients with thyroid autoimmune diseases have lower blood level of vitamin D by comparison to a general population. However, there are few studies examining vitamin D status in patients with subclinical and overt hyperthyroidism depending on the degree of disease compensation.

Objectives: The aim of this study was determination of blood 25(OH)D level in patients with subclinical and overt hyperthyroidism, and also his possible influence on disease progression.

Methods: 80 patients of reproductive age with thyrotoxicosis syndrome were recruited. The thyroid functional state was estimated by means of determination of thyroid-stimulating hormone (TSH) basal concentrations and free thyroxine in the blood serum. Subjects were invited to attend quantitative ultrasound densitometry (Sahara), and a fasting blood sample from which osteocalcin, serum N-terminal propeptide of type 1 procollagen and crosslinks were also measured.

Results: 25(OH)D level (14.9 ± 1.8 ng/ml) was significantly lower in patients with diffuse toxic goiter in the state of sub- and decompensation, comparatively with the group of women with diffuse toxic goiter in the state of stabile thyrotoxicosis compensation (21.2 ± 2.4 ng/ml) and control group (23.9 ± 2.7 ng/ml). The results of correlation analysis testify to the presence in patients with diffuse toxic goiter in the state of thyrotoxicosis sub- and decompensation significant negative connection between blood 25(OH)D and level of thyrotropin receptor antibodies ($r = -0.47$; $p < 0.05$). Frequency of bone mineral density disorders in patients with thyrotoxicosis syndrome was 52.7%, including osteopenia in 40% and osteoporosis in 12.7%. A basic factor that results in the decline of bone mineral density in patients with thyrotoxicosis syndrome is excessive products of thyroid hormones, and also TSH-suppressive doses of levothyroxine.

Conclusions: The vitamin D blood level depends on the degree of thyrotoxicosis compensation. Significant association between 25(OH)D range and level of thyrotropin receptor antibodies established in the group of patients with an uncompensated thyrotoxicosis.

WC005. THE EFFECTS OF VITAMIN D SUPPLEMENTATION IN THE GLUCOSE AND LIPID BLOOD PROFILES IN PERSONS WITH TYPE 2 DIABETES MELLITUS

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Introduction: Some recent epidemiological studies suggest an important role for vitamin D in the glycemic and lipid homeostasis.

Objectives: Longitudinal study to evaluate the possible effects of vitamin D supplementation in several cardio-metabolic and anthropometric variables of people affected by type 2 diabetes mellitus.

Methods: 21 T2DM women treated with oral antidiabetics of the bone metabolic diseases out-patient clinic were evaluated before and one year after beginning the supplementation with vitamin D. Fasting blood was collected for 25-hydroxy-vitamin D [25(OH)D], glucose, HbA1c, total cholesterol, LDL- and HDL- cholesterol and triglycerides measurements. Total body fat mass and fat percentage