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.

WCO03. 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 (± 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.

WCO04. 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.

WCO05. 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

were accessed by DXA. Body mass index (BMI) was also calculated. Adequate statistical tests were used (statistical significance $p < 0.05$).

Results: The mean 25(OH)D after supplementation with vitamin D was significantly higher :16.2 (± 6.7) vs 26.6 (± 9.1) ng/ml, $p < 0.05$. A significant reduction in the mean total cholesterol [180.3 (± 20.2) vs 164.6 (± 21.9) mg/dl, $p = 0.033$) was detected after one year of vitamin D supplementation. However, no changes were observed in the mean LDL-cholesterol, HDL-cholesterol, triglycerides, glycaemia, HbA1c neither in the means of other anthropometric variables.

Conclusions: In T2DM women treated with antidiabetic oral medications and supplementation with vitamin D, a significant increase in the mean total cholesterol was observed and no change in the glycemic control or the remaining lipid profile was detected. The results of this study are consistent with the data of recent studies, which suggest that vitamin D is a possible marker of the general health, but not a potential therapy for T2DM.

WCO06. THERAPY OF PEOPLE WITH MUSCULOSKELETAL SYSTEM DISEASES AND VITAMIN D DEFICIENCY

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Introduction: We have seen no well-defined approach to calculating vitamin D dose in patients with musculoskeletal system diseases and vitamin D deficiency.

Objectives: To assess the efficacy and safety of individual targeted vitamin D therapy in postmenopausal women with skeletal diseases (systemic osteoporosis and osteoarthritis).

Methods: Individual targeted therapy of vitamin D deficiency consists of two periods – saturation period and maintenance therapy period, during which patients take it constantly. Duration of saturation therapy is calculated by the formula: Saturation therapy duration (days) = (100 – blood 25(OH)D level (ng/mL)) × body weight (kg)/100, The therapy for saturation includes combined calcium (1,000 mg of calcium and 800 IU of vitamin D) and 3,000 IU of vitamin D per day. Maintenance therapy includes 2 000 IU of vitamin D per day. The study involved 70 postmenopausal women aged 46-87 years. All patients were divided into two groups: main. 50 women who took individual targeted vitamin D therapy (50 subjects, 65.1 ± 8.8 years old, BMI 27.22 ± 4.51 kg/m^2) and control (20 subjects, 64.5 ± 11.1 years old, BMI 26.68 ± 4.95 kg/m^2). The duration of the treatment consists of 3 months starting on the 1st Oct 2013.

Results: In 3 months after the start of the treatment there was a significant ($p < 0.001$) increase in 25(OH)D levels in the treatment group: 35.60 ± 8.21 nmol/L as compared to baseline levels of 25.20 ± 9.76 nmol/l. Remarkably, the treatment was most effective in the oldest subgroup (> 70 yrs.), as well as in subjects with the BMI 25-28,99 kg/m^2. After the treatment, there were no changes in calcium levels.

Conclusions: The suggested individual targeted vitamin D therapy was proven to be effective in postmenopausal women. As the treatment turned out to be effective, relatively quick, and had a reasonable safety profile it may be beneficial for all vitamin D deficient postmenopausal women.

WCO07. THE PREVALENCE OF HYPOVITAMINOSIS D INPORTUGAL – THE PORMETS STUDY

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Objective: The aim of our study was to evaluate the prevalence of hypovitaminosis D and the associations between 25(OH)D and PTH serum levels in a sample of individuals representative of the mainland Portuguese population.

Material and methods: PORMETS is a national cross-sectional study of a representative sample of 4095 non-institutionalized adults, selected from the primary health care centers lists. 500 participants (286 women and 214 men) were randomly selected to be included in the present study. A fasting venous blood sample was collected and freezing samples were stored at –80º C. Vitamin D adequacy was classified according to IOM criteria. A "blunted PTH response" was defined as a PTH within the reference range in the presence of a 25OHD < 12 ng/mL.

Results: Mean (standard deviation) 25(OH)D levels were 14.1 (5.8)ng/mL. According to Vitamin D adequacy categories, deficiency was present in 37.7 %, insufficiency in 47.9%, inadequate in 13.8% and optimal levels in 0.6% of the participants. PTH and 25(OH)D levels were not significantly correlated and a "blunted PTH response" was presented in 89.0% of the participant with vitamin D deficiency.

Conclusions: A high prevalence of hypovitaminosis D was observed in this Portuguese population-based study. These results are supported by previously published evidence from Portugal, although in specific population groups recruited in hospital setting. Attending to low levels and inadequate intake of Vitamin D and possible insufficient solar exposure in the general population it is urgent to develop national policies to increase awareness of the importance of Vitamin D for good health and to develop strategies for the diagnosis and treatment of hypovitaminosis D, namely in at-risk groups. Food fortification may also deserve a broad national debate and lifestyle changes, including weight control and outdoor physical activity must also be encouraged.