

mortality from COVID-19 disease was recently shown while a recent study has claimed lower COVID-19 cases in European countries with a better vitamin D status. **Aims:** To further elucidate the possible role of vitamin D population status in the COVID-19 pandemic, we examined the associations between published representative and standardized population vitamin D data on European population vitamin D status and the Worldometer COVID-19 data. **Methods:** Data from the Worldometer on 26 European countries populated >4 million (M) were analyzed. **Results:** On 19-June-2020, linear regression found no correlation between published representative-standardized population vitamin-D concentrations and the total cases-recovered/M, but negative correlations predicting a reduction of 47-64-80% in serious-critical illnesses/M and of 61-82-102.4% in deaths/M, further enhanced when adapting for life expectancy by 133-177-221% if 25(OH)D concentrations reach 100-125-150 nmol/L. On 15-August-2020 these correlations were sustained indicating a truthful association, yet not proving causality. Weighted ANOVA was performed to evaluate serious-critical/M ($R^2=0.22$) by the vitamin-D population status (deficient-D <50, insufficient-IN 50–62.5, mildly insufficient-MIN >62.5–75 and sufficient-S >75 nmol/L) and ANCOVA the deaths/M ($R^2=0.629$) after controlling for life expectancy ($R^2=0.47$). Serious-critical showed a decreasing trend ($p<0.001$) from population status D ($p<0.001$) to IN: 9.2%, $p<0.001$, MIN: 47.6%, $p<0.044$ and S: 100% (reference). For deaths/M the respective decreasing trend ($p<0.001$) was 62.9% from D ($p<0.001$) to IN ($p<0.001$), 65.15% to MIN ($p<0.001$) and 78.8% to S ($p=0.041$). **Conclusions:** Following the Endocrine Society's expert committee recommendations, without previous testing being necessary, reaching and maintaining a serum 25(OH)D of 100–150 nmol/L (40–60 ng/ml) could be achieved by an initial supplementation with the upper tolerable daily intake doses (IU/day) for up to two months: <1yr 2000, 1-18yrs 4000 and all adults 10,000 (obese x 2–3 times more) and then with the maintenance proposed doses that do not require medical supervision, practically identical with the IOM's upper tolerable limits: 1000 <6m, 1500 6m-1yr, 2500 1-3yrs, 3000 4-8yrs, and 4000 >8yrs, with adults and adolescents requiring 4000–5000 (obese x 2). Vitamin D may not prevent SARS-CoV-2 from spreading but may protect, without any risk of toxicity, from serious-critical illness and death from COVID-19 disease. While awaiting well-designed prospective studies, following the proposed approach, the gain for global public health and not only against SARS-CoV-2 may just prove invaluable.

Bone and Mineral Metabolism

VITAMIN D, DIABETES AND ENERGY METABOLISM

Body Composition And Bone Mineral Differences According to Lamin A (LMNA) Genotype in Familial Partial Lipodystrophy Type 2

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Phenotypic heterogeneity is well known in Familial Partial Lipodystrophy Type 2 (FPLD2), a rare form of adipose

tissue disorder caused by pathogenic mutations in *LMNA* gene. Animal studies from our group have identified an association between adipose tissue loss and an increase in bone mineral density (BMD) in a mouse model with adipose tissue specific knockout of *LMNA* gene. Aiming to translate this observation to patients with FPLD2, we analyzed body composition data obtained by dual X-ray absorptiometry from 61 patients diagnosed with FPLD2 and 61 individuals with no diagnosis of FPLD (nFPLD) matched for sex, age and body mass index. As expected, we observed lower total fat mass in FPLD2 patients compared to nFPLD (15.8 ± 9.3 kg vs. 28.5 ± 12.4 kg, $p=0.001$), as well as lower fat mass in regions of arms, legs and trunk. Interestingly, patients with FPLD2 showed lower bone mineral density (BMD) compared to nFPLD 1.0 ± 0.2 g/cm³ vs 1.2 ± 0.1 g/cm³, $p=0.01$ and lower t-score (0.2 ± 1.8 vs. 1.5 ± 1.2). We then aimed to determine if the patients with FPLD2 displayed differences with respect to genotype. For these analyses, the FPLD2 group was divided according to the pathogenic variant; 42 with mutations on the hot spot codon of the *LMNA* gene (R482: 50.2 ± 164.8 years, 76% women) and 19 with non-hot spot codon mutations (nR482: 44.8 ± 12.8 years, 78% women). Patients in the R482 group were older when they were first diagnosed with lipodystrophy (39.6 ± 18.6 years vs. 36.5 ± 12.3 years, $p=0.05$). Also, nR482 group presented with more progeroid characteristics. Patients in n-R482 group also had lower weight compared to R482 and nFPLD groups (64.4 ± 14.4 vs. 73.3 ± 18.5 and 77.6 ± 16.6 kg, $p=0.01$), as well as lower total fat mass (15.3 ± 5.1 vs. 15.8 ± 9.3 and 25.7 ± 11.4 kg, $p=0.01$) and fat mass ratio (5.8 ± 1.9 vs. 5.9 ± 3.1 and 9.0 ± 4.1 , $p=0.01$). Control group bone mass was significantly higher in arms, legs and trunk compared to the R482 and nR482 groups. Moreover, the R482 group had lower bone mass in the legs compared to nR482 (690.5 ± 227.2 vs. 703.5 ± 95.3 g, $p=0.01$), while showing higher trunk bone mass (676.4 ± 266.7 vs. 674.1 ± 79.3 , $p=0.04$), in addition to greater fat mass in the legs (3.3 ± 1.6 vs. 2.6 ± 0.7 kg, $p=0.05$) and trunk areas (10.3 ± 6.1 vs. 10.0 ± 4.2 kg, $p=0.03$). There were no differences in total bone mass, BMD, and t-scores, according to genotype. Our data showed more fat preservation in *LMNA* R482 than nR482, presumably leading to a later lipodystrophy diagnosis. Furthermore, bone mass in different regions may be affected by *LMNA* genotype; however, more studies are needed to define the bone phenotype and fracture risk in FPLD2 population fully.

Bone and Mineral Metabolism

VITAMIN D, DIABETES AND ENERGY METABOLISM

Bone Markers Are Diminished in Offspring of Long-Lived Families Compared With Matched Controls, but Respond Equally to T3 and rhTSH

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Objective: We explored the effects of T3 and rhTSH administration on bone turnover in subjects of the Leiden Longevity Study. **Design:** Twenty-six subjects (13 offspring and 13 matched controls), mean age 68 y, underwent