

## **THE STATUS OF 25-HYDROXYVITAMIN D IN THE SOUTHWEST OF BELGIUM**

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### **Aims:**

It is now clear that subclinical hypovitaminosis D can result in adverse skeletal effects which may manifest after a long latent period. Vitamin D deficiency is a widespread medical condition that has been linked to the health and fracture risk of human bone on the basis of low calcium intake and reduced bone density. It has been also demonstrated that this deficiency also reduce bone quality.

Ritchie and Busse have reported their findings in the journal "*ScienceTranslational Medicine*". The paper is titled "*Vitamin D deficiency induces early signs of Aging in Human bone, increasing the risk of fracture*".

Vitamin D is essential for the body to absorb calcium. The body normally synthesizes vitamin D in the skin following exposure to sunlight – hence the "sunshine" moniker. However, when vitamin D serum concentrations become deficient, the body will remove calcium from bone to maintain normal calcium blood levels. This removal of calcium from existing bone hampers the mineralization process required for the formation of new bone mass. In children, vitamin D deficiency can lead to rickets. In adults, vitamin D deficiency causes osteomalacia, a softening of the bones associated with defective mineralization that results in bone pain, muscle weakness, and increased risk of bone deformation and fracture. While treatments with vitamin D and calcium supplements are effective, success has been achieved with only modest increases in bone mineral density, suggesting other factors also play a role in reducing fracture risks.

As important and global health problem is the levels deficit of 25 OH (hydroxyl) vitamin D for a special women's category, the perimenopausal women, that include the pre and post menopausal women.

In Belgium, it has been told that this deficit concern younger population.

The aim of the study is to evaluate the status of 25-hydroxyvitamin D [25(OH) D] by determination of serum [25(OH) D] concentrations in all consecutive patients referred for thyroid investigations or check-up, patients of different ages, supposed not concerned by any bone or muscular disease.

This study was performed in a hospital department located in the southwest of Belgium.

### **Methods:**

Between November 2011 and July 2013, a total of 579 (493 females, 86 males) adult and younger patients without any supplementation by vitamin D, no chronic intestinal diseases, no known metabolic disease, and without any selection, were recruited in this prospective study. Blood measurement of the serum [25(OH) D] concentration was performed in each patient.

Deficiency refers to those with vitamin D blood levels below 30 ng/ml and severe deficiency below 10ng/ml. The patients were divided into two groups by sex.

### **Results:**

According to the Belgian references, among the 493 females, 83% had vitamin D blood levels below the cut-off (30 ng/ml) and by the same way 87% of the 86 males. Most of the postmenopausal female had significant deficiency. Overall, the average blood level for females (18,21) was similar than males (19,03). 15% of females and 15% of males had vitamin D blood levels below 10 ng/ml. In these cases, the mean age was 59 (27 to 84) in females and 65 (45 to 82) in males. By comparison to overall population the mean age was 56 (18 to 92) in females and 57 (23 to 87) in males. There is no correlation, by the way, between the two groups by reference to severe deficiency.

### **Discussion and conclusion:**

Most Belgian people, in this study had low vitamin D levels as in many other countries.

A high prevalence of hypovitaminose D was observed in the studied male and female population including the younger people.

Vitamin D deficiency has been associated with both decline in bone mass and decrease muscle strength leading to increased risk of fall and subsequently hip fractures.

Vitamin D plays an important role in skeletal development, bone health maintenance and neuromuscular function.

Vitamin D status influences cortical bone development in childhood.

Hypovitaminose D affects skeletal health in the elderly by reducing BMD and increasing fracture risk.

Optimal vitamin D repletion is necessary to maximize the response to biphosphonates in terms of both BMD changes and anti fracture efficacy.

This study shows that hypovitaminose D is often unrecognized and untreated.

The serum [25(OH) D] concentration is the best available clinical indicator of vitamin D status.

Considering the high prevalence of hypovitaminosis D in many locations in the world, the community education for prevention of osteoporosis and daily vitamin D supplementation may be necessary for prophylaxis.

In more recent studies, it has been told that a low level of [25(OH) D] is an independent risk factor for cardiovascular events and for sudden cardiac death <sup>(1,2)</sup>.

Although the underlying mechanisms are largely unknown and despite this epidemiological probability, whether vitamin D screening and supplementation reduce cardiovascular risk is still matter of debate <sup>(3,4)</sup>.

Led by Robert P. Heaney, M.D., John A. Creighton University Professor at Creighton University and research director at GrassrootsHealth, the research team joined efforts to refine known associations of vitamin D with insulin resistance, a precursor to type 2 diabetes mellitus, and blood pressure. While insufficient vitamin D has long been associated with increased insulin resistance and hypertension, this study is the first to prove that the relationship is not linear or consistent across the full range of vitamin D status. Instead, it identifies a specific range where the association is strongest? 16-36 ng/ml (40-90 nmol/L) of 25-hydroxyvitamin D, the blood measurement of vitamin D status. Furthermore, the results suggest that a level of at least 32 ng/ml (80 nmol/L) must be achieved to ensure small but useful improvements in both blood sugar control and blood pressure.

Some studies suggests that adequate vitamin D may have benefits, such as lowering the risk of breast <sup>(5)</sup> and colorectal cancer <sup>(6)</sup>, cardiovascular disease in men<sup>(7)</sup> and multiple sclerosis<sup>(8)</sup>.

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