

RECOMMENDATIONS FOR AN APPROPRIATE REQUEST FOR THE DETERMINATION OF SERUM LEVELS OF VITAMIN D (25-HYDROXYVITAMIN D)

INTRODUCTION:

In recent years, the determination of Vitamin D, 25-hydroxyvitamin D, has increased notably, becoming a common test within the usual profiles of Biochemistry at Clinical Analysis laboratories in the Western world.

This fact has demonstrated the existence of a deficit of this vitamin, at a global level, with or without associated comorbidities. Therefore, measures should be adopted in order to rationalise the request for this test, with the objective of undertaking it only in cases where there is a clear clinical indication.

PHYSIOPATHOLOGY

The main forms of Vitamin D are Vitamin D3 (Cholecalciferol) and Vitamin D2 (Ergocalciferol). In humans, the main contribution of vitamin D comes from the conversion of 7-dehydrocholesterol into cholecalciferol in the skin, through the action of ultraviolet rays. Other sources, such as certain foods, either of animal (Cholecalciferol), or vegetable origin (Ergosterol), may provide vitamin D; this contribution is not significant, as there are not foods which are highly rich in this vitamin.

It is a fat-soluble vitamin and the liver and kidney act in its metabolism. Hepatocytes convert vitamin D2 or D3 into 25-hydroxycholecalciferol and in the cells of the renal tubule, a new produce hydroxylation occurs which transforms 25-hydroxycholecalciferol into 1-25 dihydroxyvitamin D, which is the biologically active molecule.

Among the classic functions of Vitamin D, the main function is the regulation of levels of calcemia to maintain adequate homeostasis of mineral and bone metabolism. However, Vitamin D also has autocrine and paracrine properties throughout the body, its receptors being present in all human cells. Vitamin 1-25 dihydroxyvitamin D, have functions to regulate the transcription mechanisms of 3% of the genome involved in cell differentiation and growth.

SITUATION OF LEVELS OF VITAMIN D IN SPAIN:

Vitamin D deficiency/insufficiency constitute an apparent epidemic at a global level, which affects over half of the population: 88% of the population has serum levels of Vitamin D (25 hydroxyvitamin) under 30 ng/mL, 30% under 20 ng/mL and 7% under 10 ng/mL. In Spain, all studies carried out until 2015 show a similar situation; in people over 65 years of age, 80-100% present serum levels of under 20 ng/mL, while in people under 65, vitamin D deficit (under 20ng/mL) affects 40% of the population. The explanation of this data is that the majority of the Spanish territory is above 35°N latitude, which would cause a lower synthesis of Vitamin D due to the action of UV rays in winter and spring. Additionally, the high temperatures in Spain during the summer mean that sun exposure is insufficient, as people (especially older people) shelter from the sun for the majority of the day, causing serum levels of Vitamin D which are even lower than in winter. In this regard, it is necessary to take into account that a sun protection factor of 8 impedes the synthesis of Vitamin D, a factor to take into account in the Vitamin D status in young people.

OPTIMAL CONCENTRATIONS OF VITAMIN D:

The cut-off point of normality differs between scientific associations. In the United States, the Institute of Medicine (IOM) proposes 20 ng/mL, and the International Osteoporosis Foundation (IOF) and the American Society for Endocrinology propose 30 ng/mL. In Spain, the Spanish Society for Bone and Mineral Metabolism Research (SEIOMM), the Spanish Society of Endocrinology and Nutrition (SEEN) and the majority of scientific

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associations also propose the level of 30 ng/mL as a lower limit for normality and thus sufficiency of Vitamin D.

According to current studies, the serum concentration of Vitamin D above 30 ng/mL ensures adequate bone health, while higher levels are probably necessary to prevent colorectal cancer and cardiovascular or dental pathologies.

RECOMMENDATIONS FOR REQUEST OF VITAMIN D (25 HYDROXYVITAMIN D) BASED ON EVIDENCE:

The Osteoporosis and Bone Metabolism work group of the SEEN has created the document: "Recommendations on Vitamin D for the general public", setting out recommendations based on evidence, age, risk group and associated pathology.

This document concludes:

"Universal screening for Vitamin D is not recommended. Public health measures must be directed at individuals or groups which accumulate risk factors."

"Therefore, the determination of the vitamin D status is reasonable in groups at high risk of vitamin D deficiency, as well as in those which may expect a rapid response in terms of health."

Among the individuals at high risk of Vitamin D Deficit are:

- Patients hospitalised for long periods of time.
- Institutionalised elderly people.
- Individuals with prolonged immobility.
- Individuals who suffer from Malignancies or individuals with skin conditions limiting their sun exposure.
- Individuals who suffer from gastrointestinal malabsorption of different origins (celiac disease, etc.).
- Pregnant women.

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"Indicaciones para la determinación de niveles séricos de Vitamina D"

Master plan of the Biological Diagnosis network of

Osakidetza

2015

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