

## Role of Vitamin D in Pediatric Population Health with Obesity

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Childhood obesity is a public health problem in many countries around the world. Its control is difficult because its etiology is multifactorial, largely due to changes in the regional food pattern that has happened in many occasions with globalization. Vitamins and minerals participate as co-enzymes in many physiological processes of the organism. The deficit of many of them is associated with specific pathological situations. In this manuscript we will specifically address the vitamin D deficiency in the pediatric population.

Vitamin D is a serosteroid hormone, which is obtained by ultraviolet irradiation of the plant steroid ergosterol, and the synthesis of the compound 7-dehydrocholesterol as Vitamin D<sub>3</sub> [1], these precursors are absorbed at the intestinal level, to pass through the portal circulation and to be activated By hepatic hydroxylation to 25 (OH) D which is the main circulating form of vitamin D (biologically inert), this prehormone is hydroxylated at the renal level forming the 1, 25-dihydroxycholecalciferol (active form) that is responsible for the Actions of vitamin D.

The main functions of this vitamin are: regulation of calcium-phosphorus in the body, regulating the production and secretion of insulin, prolactin, interleukin-2 and tumor necrosis factor, modulation of myocardial contraction and vascular tone, modulate liver regeneration, reduce the proliferation of some cell lines [2-5].

The prevalence of vitamin D deficiency is variable, especially in the pediatric population in which it has increased in recent years, and is considered to be underdiagnosed. The prevalence reported in the obese pediatric population varies from 60 to 70% in Europeans, 60 - 78% in the United States, 93% in Canada, 10 - 53% in Asia. In Latin America, the Caribbean and Mexico, high prevalences are reported when adult obesity has been studied; however, at the national level, there are few reports in the pediatric population, estimated in the center of the country, deficiency in 24% and failure in 30% in The preschool age, in schoolchildren by 10% and 18% respectively [6-11].

The causes of deficiency and insufficiency are varied, including insufficient diet, intestinal absorption disorders, decreased skin synthesis (dark skin, poor exposure to sunlight, use of sun block, air pollution), and some hepatic, renal, and obesity hydroxylation disorders [12-14].

Vitamin D deficiency is associated with a range of clinical conditions such as metabolic syndrome, arterial hypertension, insulin resistance, type 1 and 2 diabetes mellitus, infectious diseases, and alterations in the modulation of lipogenesis [15-17]. Very recently it has been associated with obesity, since it has been documented in this type of patients the presence of low concentrations of this vitamin.

It is extremely important to improve the consumption of vitamins and minerals in the general population, especially in pediatric patients, who are in a process of constant growth and development and are therefore very vulnerable to damage due to deficiencies of these micronutrients. Nutrition education focused on this population group should be a priority for families, schools and society in general.

It is necessary to generate more research studies on the functions of vitamin D in the different organic functions and to provide evidence about the effectiveness of supplementation of this vitamin in the prevention of metabolic diseases, which are increasingly frequent in the pediatric population.

Bibliography

1. Norman AW. "Vitamina D. En: Ziegler EE, Filer LJ (eds). Conocimientos actuales sobre nutrición. 7<sup>th</sup> edition. OPS (1998).
2. Shoback D, *et al.* "Mineral metabolism and metabolic bone disease". En: Greenspan FS, Gradner DG (eds): Basic and clinical endocrinology. 6<sup>th</sup> edition. Nueva York, Lange Medical Books/McGraw-Hill (2001).
3. Holick MF. "Vitamin D: photobiology, metabolism, mechanism of action, and clinical applications". En: Favus MJ (ed): Primer on the metabolic bone diseases and disorders of mineral metabolism. 4<sup>th</sup> edition. Philadelphia, Lippincott Williams and Wilkins (1999).
4. Holick MF. "McCollum Award Lectura, 1994: Vitamin D: new horizons for the 21<sup>st</sup> century". *American Journal of Clinical Nutrition* 60.4 (1994): 619-630.
5. Clemens TL., *et al.* "Vitamin D". En : Becker KL (ed): Principles and practice of endocrinology and metabolism. 3<sup>rd</sup> edition. Philadelphia, Lippincott Williams (2001).
6. Rosenblum Castro and Moore Kaplan. "Calcium and vitamin D supplementation is associated with decreased abdominal visceral adipose tissue in overweight and obese adults". *Journal of Clinical Nutrition* 95.1 (2012): 101-108.
7. Luang. "The relationship of serum 25-hydroxyvitamin D with glucose homeostasis in obese children and adolescents in Zhejiang, china". *International Journal of Pediatric Endocrinology* (2015): 049.
8. Gutiérrez-Medina., *et al.* "Elevada prevalencia de déficit de vitamina D entre los niños y adolescentes obesos españoles". *Anales de Pediatría* 80.4 (2014): 229-235.
9. Valle-Leal., *et al.* "Índice cintura-estatura como indicador de riesgo metabólico en niños". *Revista Chilena de Pediatría* 87.3 (2016): 180-185.
10. Oliveira Novaes and Azerdo Leite. "Association of vitamin D insufficiency with adiposity and metabolic disorders in Brazilian adolescents". *Public Health Nutrition* 17.4 (2013): 787-794.
11. Flores Barquera, *et al.* "Concentraciones séricas de vitamina D en niños mexicanos, Resultados ENSANUT" (2006).
12. Mendoza-Zubieta., *et al.* "Vitamina D en enfermedades del metabolismo óseo y mineral" 4 (2006): 45-54.
13. D Miranda., *et al.* "Diagnostico y tratamiento de la deficiencia de vitamina D". *Revista chilena de nutrición* 36.3 (2009): 269-277.
14. M Barberán., *et al.* "Déficit de vitamina D. Revisión epidemiológica actual". *Revista - Hospital Clínico Universidad de Chile* 25 (2014): 127-134.
15. Alfonso L and Torrejón. "Vitamina D y sus efectos no clásicos". *Revista Española de Salud Pública* 86.5 (2012): 453-459.
16. Vanlint. "Vitamin D and Obesity". *Nutrients* 5.3 (2013): 949-956.
17. CA Peterson., *et al.* "Vitamin D insufficiency and insulin resistance in obese adolescents". *Therapeutic Advances in Endocrinology and Metabolism* 5.6 (2014): 166-189.