

HYPERVITAMINOSIS BY VITAMIN D SUPPLEMENTATION: RISK ASSESSMENT AND IMPACTS ON HUMAN HEALTH

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INTRODUCTION: Vitamin D is a secosteroid hormone essential for bone metabolism, synthesized in the skin by exposure to UVB rays and obtained through dietary or supplementation. Its main isoforms are vitamin D₂ (ergocalciferol) and D₃ (cholecalciferol), both lipophilic, are converted in the liver to 25-(OH)-D, the main marker of vitamin status. The serum quantification of 25-(OH)-D is performed by immunoassays or chromatographic techniques, such as LC-MS/MS. The indiscriminate use of vitamin D supplements, often carried out without proper guidance, can lead to vitamin D toxicity (VDT) or hypervitaminosis, characterized by elevated serum levels of 25-(OH)-D and risk of hypercalcemia. **OBJECTIVES:** This study aimed to analyze the risks and impacts of vitamin D supplementation on human health, to analyze whether the different analytical methods express differences in the quantification of the analyte 25-(OH)-D (calcidiol) and investigate whether the supplementation of cholecalciferol or ergocalciferol exert differences in the generation of 1,25-(OH)₂-D (calcitriol). **MATERIALS AND METHODS:** A descriptive and retrospective bibliographic survey was carried out using different electronic databases such as *PubMed*, *Scopus*, *Web of Science*, *CAPES* and *Scielo*. **RESULTS AND CONCLUSION:** It was seen that most of the evidence points to the superiority of vitamin D₃ in the maintenance of serum levels of 25-(OH)-D. Immunoassays, although accessible, present significant variability between methods and laboratories, which compromises the comparability of results, and even the gold standard technique, LC-MS/MS presents analytical challenges such as interferences by epimers. In addition, VDT may be asymptomatic or manifest with mild to severe symptoms, including neuropsychiatric and renal disorders. Unlike skin synthesis, which has metabolic self-regulation, exogenous supplementation does not inhibit excessive production, which increases the risk of hypervitaminosis. Therefore, it is concluded that although vitamin D is essential for bone health, supplementation requires caution. Further research in the area, clear clinical guidelines, analytical standardization and greater medical awareness are needed to ensure the therapeutic efficacy of vitamin D safely, preventing adverse events associated with hypervitaminosis D.

Keywords: 1,25-dihydroxycholecalciferol; Hypercalcemia; Supplementation; Risks.