Cyboran Katarzyna, Kuc Monika, Lis Jakub, Machaj Damian, Polak Jakub. The benefits of vitamin D3 supplementation for menopausal women - literature review. Journal of Education, Health and Sport. 2021;11(6):47-51. eISSN 2391-8306. DOI http://dx.doi.org/10.12775/JEHS.2021.11.06.006
https://apcz.umk.pl/czasopisma/index.php/JEHS/article/view/JEHS.2021.11.06.006
https://zenodo.org/record/4912558

The journal has had 5 points in Ministry of Science and Higher Education parametric evaluation. § 8. 2) and § 12. 1. 2) 22.02.2019.

Received: 29.05.2021. Revised: 29.05.2021. Accepted: 08.06.2021.

The benefits of vitamin D3 supplementation for menopausal women - literature review

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ABSTRACT

Vitamin D represents a common name for cholecalciferol and ergocalciferol. It occurs in the inactive form but as the result of hydroxylation in position 1 or 25, becomes an active vitamin. Cholecalciferol arises from an inactive form under the influence of UV radiation in the temperature of the human body whereas ergosterol is delivered to the organism from plant-based food. Vitamin D has a significant impact on postmenopausal women's health. The level of estrogen declines for the woman in the menopausal period. It has consequences, among others, of calcium losses. This is the reason why women of this age are in the risk group for come down with osteoporosis. Vitamin D helps with the absorption of calcium and phosphorus. These minerals have an equally important role during the period of menopause. Women in this age group should take from 1000 to 1500mg of calcium daily. However,

excessive calcium intake is not recommended, because exceeding the norm does not bring better results. In spite of this fact, the detection of vitamin D deficiency in postmenopausal women and starting treatment has a positive effect on their health. [1]

KEY WORDS: vitamin D, postmenopausal, deficiency

INTRODUCTION AND PURPOSE

The main goal of this review is to indicate a correlation between the level of vitamin D and the health of postmenopausal women. The patients in this life period often experience symptoms like a frame of mind or hot flashes. [2][3] The effect of this is a significant decline in the quality of life. The usage of hormonal medicines, antidepressants, or anticonvulsants may cause unwanted side effects. [3][4][5] Hence, constantly looking for mechanisms that are responsible for these symptoms is important. Owing to this fact, it would be possible to develop new treatment strategies. [3]

According to the collected data, there is probably a relationship between vitamin D levels and symptoms in menopause. [3] The activity of the enzyme responsible for the conversion of inactive vitamin D into active vitamin is increased thanks to estrogen. [6]

In the randomized research of Dong and co-authors took part 36,282 postmenopausal women. The patients were supplementing 1g of calcium and 10μg of vitamin D. There was no impact to reduce the risk of coronary events and stroke. It has been suggested that the dose was most likely too low. [7]

DESCRIPTION OF THE STATE OF KNOWLEDGE

Cristina Capatina and co-authors from the University of Bucharest demonstrated in 2014 the effect of evaluation BMD in postmenopausal women. They assessed parameters such as total and ionised calcium, phosphorus, alkaline phosphatase (ALP), 25 hydroxyvitamin D (25OHD), parathyroid hormone (PTH), osteocalcin, beta crosslaps.

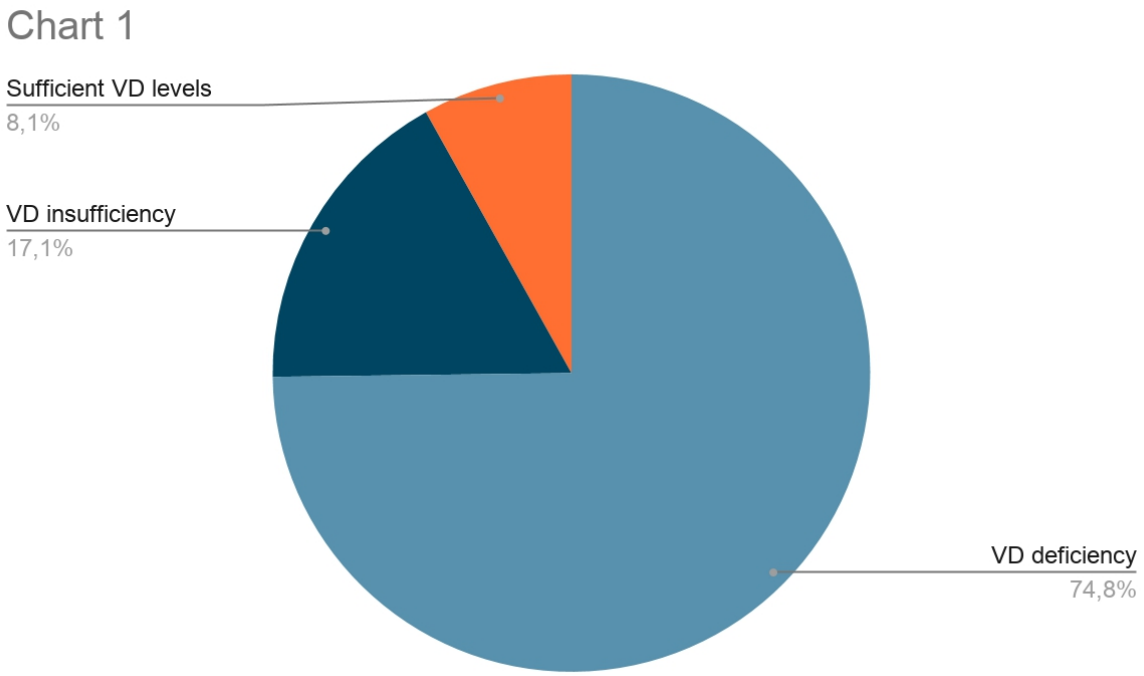

Chart 1 presents that 17.1% of cases had VD levels insufficiency and 74.8% had VD deficiency. It means that 91.9% had 25(OH)D serum levels below 30 ng/ml. Sufficient VD levels were observed only in 8.1% of cases. Fragility fractures occurred for 45.83% of the osteoporotic patients, 27.27% of the people with osteopenia and the percent for women with normal BMD was 15.15%.

Thirty-two women, which comprise 26% of evaluated people, were on VD supplementation during the examination. The 25(OH)D level was considerably higher among these tested persons with earlier fragility fractures (p=0.018) and osteoporosis (p=0.008).

The correlation between the concentration of 250HD, PTH, ALP (alkaline phosphatase), and osteocalcin was negative. Significant correlation inverse with the radius BMD, T, and Z scores (p=0.004) was assessed by the bone markers.

For the cases with VD deficiency, 27.17% of them had secondary hyperparathyroidism and also 250HD concentration was much lower (p=0.000). [8]

S. Gaugris and co-authors reviewed publications in the past 10 years on the basis of which the incidence of vitamin D deficiency was assessed.

The spread of 25(OH) vitamin D concentration lower than 12 ng/ml for the osteoporotic group of people was in a range of 12.5 - 76%. The situation was worse for patients with a cut-off of 15 ng/ml with fractures in the course of the disease. In this case, the spread reached 50 - 70%. Whereas, for the women in the menopausal period spread of 25(OH) vitamin D concentration lower than 20 ng/ml was in the range of 1.6 - 86% accordingly for community-living and institutionalized women. The main reasons for vitamin D insufficiency are a short

time of exposure to the sun, especially during winter, a diet low in vitamin D, a nursing home environment, and elderly age (over 70 years). [9]

Navaneethakrishnan Suganthan and co-authors described a study that assessed vitamin D levels in postmenopausal women at the Endocrinology Department of Jaffna Clinical Hospital from January to December 2018. The mean age of examined patients was between 67 and 68 years old. The youngest woman was 38 years old and the oldest, 84. The average concentration of VD was 27.5 ng/mL. The range of concentrations was between 11.7 and 52.5 ng/mL. The correct levels of vitamin D were only in 36.2% of cases, insufficiency in 44% but the deficiency in 19%. In the research participated 20% vegetarian in which 53% were consuming milk, 76.2% fish, and 64.8% eggs. Moreover, 71.4% had enough (more than 30 min/day) sun exposure. People with vitamin D deficiency had symptoms including proximal myopathy - 40%, muscle cramps - 43.8%, malaise - 51.4%, easy fatigability - 54.3%, bone-pain - 55.2% and the most common - paraesthesia - 57.1%. There was not a significant difference ($P > 0.05$) in the musculoskeletal symptoms between sufficient, insufficient, and deficient groups. 67.7% of participants, which equal 71 persons, passed the bone density test, 38% had osteoporosis. There was a significant correlation with the level of 25(OH) VD shown by vertebral Z score. [10]

CONCLUSIONS:

Peri and postmenopausal women are recommened to take vitamin D to prevent bone loss. A VD deficiency especially with a connection with menopause has a negative impact not only to bone health. Both of them have similar risk factors like cardiovascular, metabolic, cognitive and affective disorders. A sufficient vitamin D level may be beneficial to women's health in general. [11]

The women in postmenopausal period have a higher risk of osteoporosis, cardiovascular disease and breast cancer. A VD has a protective impact againsts cardiovascular risks, breast neoplasm and bone health. Knowledge of vitamin D properties can widen comprehension of pathophysiology of chronic conditions. Vitamin D screening supplementation, and obviously teaching the patients about preventing debilitating conditions among postmenopausal women should be provided by primary care physicians. [12]

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