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THE ROLE OF VITAMIN D IN THE PREVENTION OF OSTEOPOROSIS IN MENAPAUZAL WOMEN

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ABSTRACT:

Menopause is a natural physiological stage in a woman's life, during which, along with general age-related changes in the body, it is characterized by the gradual decline of reproductive function, and later the cessation of menstrual activity. The average age of menopause around the world is 48.8 years (95% CI 48.3–49.2). The age group of peri- and postmenopausal women in our country exceeds 21 million, and women spend almost 1/3 of their lives in conditions of estrogen deficiency.

Background: Osteoporosis is a serious, worldwide, and growing health problem; WHO has estimated the 30% of all women, older than 50 years (post-menopausal) has osteoporosis. Osteoporosis is a skeletal disorder characterized by compromised bone strength predisposing a person to an increased risk of fracture. Bone strength reflects the integration of two main features: bone density and bone quality. Vitamin D is a versatile bioregulator with a wide range of effects. This shows the importance of timely correction of vitamin D deficiency. Vitamin D deficiency is common among post-menopausal women and it is important to treat vitamin D deficiency to prevent falls and fractures in patients with osteoporosis.65-70% of women experience pathological menopause manifested by climacteric syndrome due to estrogen deficiency, with disorders of the neurovegetative system, endocrine-metabolic activity, and psycho-emotional state. In the conditions of the aging of the body and the decrease in the production of sex hormones, it is

important for postmenopausal women to maintain calcium and phosphorus homeostasis and bone health, as well as to maintain the general health of the body.

Purpose of the study: To study the health and quality of life of women in menopause, taking into account the level of vitamin D.

Menopause is the last independent menstruation in a woman's life. Menopause can be natural or artificial. The average age of natural menopause for women in Ukraine is 52.5 years. During menopause, in women, against the background of the decrease in the hormonal function of the ovaries, there is a general decrease in the level of all female sex hormones, but the rate of their decrease is different, that is, the level of progesterone decreases twice as fast. estrogen levels. [1]Therefore, during this period, women experience the so-called relative increase in estrogen levels, which can lead to the development of hyperplastic (or oncological) processes of any localization.[2]

There is also a classification according to the age of onset of menopause:

Early ovarian failure before the age of 40;

Early menopause at the age of 40-45;

Timely menopause at the age of 46-54;

Late menopause after 55 years.

Bone is remodelled constantly throughout life. Peak bone mass is around the age of 30 years after which rate of bone-resorption is greater than the rate of bone formation. Approximately 3% of cortical bone is replaced each year and 25% of trabecular bone is resorbed and replaced each year [3]. Osteoporosis is defined as bone mineral density less than 2.5 SD below the mean peak value in young adults of the same race and sex (t score of < -2.5) [4]. Women of all ethnic groups show an additional accelerated phase of bone loss, which occurs for about 10 years after the cessation of ovarian function. Total bone loss in osteoporosis may exceed 30 to 40% [5]. Vitamin D deficiency is a risk factor for fall and fracture among post-menopausal women with osteoporosis [4] and vitamin D deficiency is a pandemic [6] health problem which was attributed for several health problems

The incidence of osteoporosis gradually increases with age. In menopausal women, due to a decrease in estrogen production, calcium absorption in the small intestine is reduced, ultimately leading to a decrease in bone density [7]. The most important functions of VD are to promote the absorption of calcium and phosphorus from the small intestine, to promote new bone production and calcification, and to regulate parathyroid hormone to maintain blood calcium and phosphorus concentrations[8]. It plays a role in the prevention or treatment of osteoporosis. When VD levels are reduced, this leads to secondary hyperparathyroidism, which induces a series of changes in bone metabolism leading to reduced bone mass and osteoporotic fractures[9]. VD receptors (VDR) have been shown to be present in muscle tissue, and VD is involved in regulating the proliferation and differentiation of myoblasts, significantly improving muscle strength and function, and improving balance[10]. Myalgia, decreased muscle strength, reduced physical performance, and altered muscle morphology are common in patients with VD deficiency. A study assessed the relationship between muscle function and muscle strength in 54 postmenopausal women and found that 25(OH)D levels ≥20 ng/mL were associated with better lower limb muscle function and strength[11]. Calcium plus VD has been shown to reduce bone loss in perimenopausal and postmenopausal women. In an 18-year study of 72,337 postmenopausal women[12], adequate VD intake was found to be associated with a reduced risk of osteoporotic hip fracture in postmenopausal women. A meta-analysis demonstrated that combined calcium and VD supplementation may prevent osteoporotic hip fractures in postmenopausal women[13]. VD, a calcium-regulating hormone that affects bone metabolism and calcium homeostasis, is a commonly used drug for the prevention and treatment of osteoporosis. There is considerable controversy regarding the dose of VD for the prevention and treatment of osteoporosis, and more studies should be conducted to explore the optimal dose of VD for different populations.

There is a relationship between bone mineral density (BMD) and serum 25-hydroxyvitamin D3 [25(OH)D3][15,16]. BMD is an index used to diagnose the

risk of osteoporosis and fracture. A low BMD reflects a low bone density and an increased risk of osteoporosis[14]. A study of postmenopausal women with osteoporosis in Amsterdam found a significant positive correlation between the vita- min D status and BMD,[15] and the critical serum 25(OH)D3 level was 50 nmol/L.[16] Vitamin D sup- plements reduce the risk of fractures by reducing PTH secretion and increasing bone density. In one study of healthy postmenopausal women, vitamin D and calcium did not significantly reduce hip fractures, although bone density had improved[17].

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