Acta Scientific MEDICAL SCIENCES (ISSN: 2582-0931)

Volume 8 Issue 4 April 2024

Research Article

# Some Important Markers of Osteoporosis in Women in Menopause

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**Received:** November 16, 2023

**Published:** March 20, 2024



## Abstract

Osteoporosis is a skeletal disease characterized by low bone mass, structural destruction of bone tissue and reduced bone strength, resulting in increased the risk of fractures [1,2,9]. It is one of the most common metabolic diseases and the main cause of morbidity and mortality among postmenopausal women [3,10]. Previous studies have shown that several conditions such as aging, amenorrhea, parental history of fractures, [4,5] dietary calcium intake, low body mass index (BMI) [6-8], decreased physical activity have been suggested as associated factors in changes in bone mineral density in elderly patients.

**Keywords:** Osteoporosis; Bone Mineral Density; Bone Resorption; Osteodensitometry

## Relevance

Prior to menopause, the level of bone loss tissue in men and women is almost the same. But after the patients enter this phase of their life, they have an almost 1.5-fold increase in the chance of spontaneous fractures in comparison with the opposite sex. This is explained by the decline in estrogen levels as a consequence of menopause [1,2,4,5]. Since, it maintains a balance between resorption and bone formation. In the present study, we hoped to assess the prevalence of osteoporosis in postmenopausal women in urban and rural areas of Bukhara city, as well as to determine the risks of osteoporosis in all participants. We also analyzed the relationship between BMD (bone mineral density) and biochemical markers.

The aim of the study was to determine the criteria for diagnosing menopausal osteoporosis in different periods of menopause to prevent complications and improve the quality of life of women in this period.

## Materials and Methods of Research

The material for our research was women living in the Bukhara region. Patients who applied to the Republican Scientific Center for Emergency Medical Aid of the Bukhara branch in different departments under different diagnoses: such as dysfunctional uterine bleeding, anovulatory uterine bleeding, climacteric syndrome, arterial hypertension, hypertensive crisis. These patients were studied from 2019 to 2020 at this center. Postmenopausal women were defined as women who reported menopause in the survey. Only those participants who provided written informed consent and were willing to provide blood samples were included. Finally, 121 perimenopausal women were included in the analysis. The following participants were excluded: individuals whose

clinical data were incomplete, postmenopausal women who underwent hormone replacement therapy, with serious chronic kidney disease, chronic liver disease or osteogenesis imperfecta, with the presence of a tumor, women who had a hysterectomy, which is known to increase risk of early menopause. All participants were interviewed using a standardized questionnaire to collect data on: age, gender, menopause status, age at menopause, year after menopause, educational level, physical activity. Statistical analysis was carried out by the Fisher-Student method using the Statistica package. Significance was set at $p < 0.05$.

## Study Results

According to the results of our study, the average age of menopause was 44.05 ± 1.1. It is reliably suitable for the age of menopause in the Republic of Uzbekistan. According to the results of the study, the level of estradiol in the blood serum in the group remained almost unchanged in the first group. Decreased by 3.5 pg/ml in the second group. And in the third group, it increased by 16.5 pg / ml, which indicates a significant increase in this hormone. ALP also remained slightly changed in the first and second groups, while in the third it increased by 39 U/L. The situation with calcium also correlated with the above two data and changed only in a positive direction in the third group. The mean T and Z values were lower in the third group after treatment than in the other two groups. All data are shown in table 1.

| Parameters | Group 1, n = 15 | | Group 2, n = 15 | | Group 3, n = 15 | |
|---|---|---|---|---|---|---|
| | Before treatment | After treatment | Before treatment | After treatment | Before treatment | After treatment |
| Estradiol, pmol/l | 42,4 ± 3,4 | 44,9 ± 3,4 | 40,4 ± 3,8 | 39,6 ± 5,2 | 44,4 ± 3,4 | 60,9 ± 3,4 |
| AP units/L | 224 | 221 | 220 | 213 | 219 | 258 |
| Calcium dg/ml | 2,1 | 2,0 | 1,9 | 1,84 | 1,68 | 2,14 |
| Ultrasound densitometry (T-criteria) | 1,6 | 1,6 | 2,1 | 2,2 | 2,2 | 1,8 |

**Table 1:** Comparative data of analyzes of perimenopausal women in the dynamics of treatment, M ± m.

Note: reliability of the results $p < 0.05$.

As a result of the study, it was found that the use of Lenzetto in the combined treatment of women with blood pressure in the perimenopausal period, according to daily monitoring of blood pressure, led to a significant decrease in blood pressure with its stable normalization in 76 % of patients taking only pharmacadipine, this figure was 52%. Thus, the effectiveness of antihypertensive therapy in the main group was 24% higher than in the control group ($p < 0.01$).

Normalization of the daily blood pressure profile and restoration of physiological decrease in blood pressure at night were achieved in 70% of patients in the main group and in 46% in the control group (the difference between the groups is significant, $p < 0.01$). In the group of patients who additionally took Lenzetto, there was a significant decrease in the average heart rate, in contrast to the control group, which was associated with a decrease in the reactivity of the sympathetic system and an improvement in the adaptive capabilities of the body (Table 2).

Thus, the inclusion of Lenzetto in the complex treatment of patients with hypertension in the perimenopausal period favorably affects the daily blood pressure profile, hemodynamic parameters and increases the standard of living of women.

| Indices | Control group | | Main group | |
|---|---|---|---|---|
| | Before treatment | After treatment | Before treatment | After treatment |
| 24 hours | | | | |
| SBP, mmHg | 160,4 ± 5,2 | 141,5 ± 2,8 | 157,6 ± 2,3 | 138,5 ± 2,5 |
| DBP, mmHg | 97,3 ± 3,2 | 89,4 ± 3,0 | 95,6 ± 2.4 | 84,4 ± 2,2 |
| HR,beats/min | 77,2 ± 2,5 | 74,9 ± 2,5 | 79,3 ± 2,2 | 65,2 ± 2,0 |
| Daytime | | | | |
| SBP, mmHg | 163,6 ± 5,6 | 144,2 ± 3,4 | 167,4 ± 2,5 | 138,3 ± 2,4 |
| DBP, mmHg | 99,4 ± 3,7 | 89,5 ± 3,2 | 101,2 ± 2,3 | 86,3 ± 2,2 |
| HR,beats/min | 82,2 ± 2,3 | 76,4 ± 2,4 | 83,5 ± 2,5 | 68,2 ± 2,6 |
| Night period | | | | |
| SBP, mmHg | 152,5 ± 4,2 | 138,4 ± 4,3 | 155,4 ± 3,2 | 130,2 ± 2,5 |
| DBP, mmHg | 92,3 ± 2,4 | 88,2 ± 3,0 | 93,5 ± 2,4 | 82,5 ± 2,4 |
| HR,beats/min | 74,2 ± 2,3 | 72,2 ± 2,5 | 72,2 ± 2,5 | 62,4 ± 2,3 |

**Table 2:** Comparative indices of hemodynamic parameters in women in the perimenopausal period before and after treatment M ± m.

## Conclusions

Based on the results of the study, we can say that the level of estradiol and biochemical markers of bone metabolism decreased with age. Timely menopausal hormone therapy, osteotropic drugs can reduce the level of bone resorption and reduce the symptoms of menopause, which significantly impair a woman's quality of life. Further research is needed to examine bone-related research to establish better statistics among women in the Bukhara region.

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