INTERNATIONAL JOURNAL OF
INTEGRATIVE AND
MODERN MEDICINE

Assessment of Risk Factors for the Development of Osteoarthritis in Postmenopausal Women

Dilnoza R. Sagatova
Researcher (Ph.D), Tashkent Medical Academy
Dildora A. Nabieva
Professor (DsC), Tashkent Medical Academy

Abstract: The prevalence of osteoarthritis (OA) among menopausal women and the continuous exacerbation of degenerative changes in the joints reduce the quality of imagination of female patients and determine the social and economic significance of the disease. In them, the specificity of clinical characteristics of OA and additional concomitant pathology of joint syndrome with continuous onset require a new approach to this disease, which creates the need for coordination in diagnosis and treatment. Endothelial dysfunction and hormonal imbalance during the menopausal period have been shown to induce adverse processes associated with OA that increase blood vessel spasm around the joint, increase blood supply and nutrition to the joint and slow destruction. In them, the specificity of the clinical characteristics of OA and the additional associated pathology of joint syndrome with continuous onset require a new approach to this disease.

Keywords: osteoarthritis, menopause, body mass index, hormonal balance, joint syndrome.

Introduction.

According to the experts of the World Health Organisation (WHO) [1-5; 8-10.], osteoarthritis (OA) is the number one cause of disability among the population over 60 years of age in almost all countries of the world, and about 1/10 of the world's population suffers from this disease. Due to the disease, patients develop functional joint deficits and experience reduced or congestive disability Baltimore, Cindford, and based on studies conducted by Fremingham, the etiology of OA is a multifactorial pathology that mainly includes interstitial (advanced age, gender, obesity, heredity, reproductive status) and mechanical factors [6;9]. In addition to metabolic changes, such as obesity in women, diabetes mellitus, as well as the issues of specificity and clinical course of pathogenesis of changes in the joint in OA against the background of other concomitant conditions are reflected in the scientific works of many researchers [2;5;7]. At the moment, according to WHO experts, due to the fact that today about 2 billion people in the world have problems with overweight, it is necessary to perceive obesity as a "new epidemic" in menopausal women there are endogenous and exogenous factors that affect the endothelial vascular monolayer, in response to which endothelial cells react by suppressing or enhancing the synthesis of biologically active substances. This condition causes deficiency of anti-inflammatory cytokines, activation of matrix metalloproteases and vasoconstrictors, and impaired microcirculation leading to the development of joint syndrome. [7;9]. Studies show that estrogens are actively involved in the regulation of metabolic processes in colonic tissue, in particular, they also affect chondrocytes that promote the growth of colonic tissue. Estrogen deficiency, in turn, leads to a decrease in the number of chondrocytes, slowing down regenerative processes in colon tissue and accelerating colon destruction. This condition directly leads to increased endothelial dysfunction and, as a consequence, to deterioration of the morphofunctional state of joints and reduced quality of life of patients.[4-10].

This study involved 105 menopausal patients registered in the arthrology department of the SOTC (specialized outpatient treatment course) multidisciplinary clinic of the Tashkent Medical Academy (TMA) from 2020 to 2022, who confirmed the diagnosis of knee OA, undergoing inpatient treatment in the departments of cardioreumatology and rheumatology. To fulfil the objectives of the research

work, patients were prospectively analysed. They analysed the clinical course of the disease and the results of laboratory and instrumental examinations.

According to the data collected from the anamnesis of the patients who participated in the conducted research work, the average age of the patients at the time of the appearance of the first symptoms of the disease in women with OA in the pre- and postmenopausal period was 53.3±1.7 years. Regarding the mean age of the patients and the duration of the disease, postmenopausal women showed an advantage (57.1±4.2 and 5.1±1.2, respectively). It can also be observed that the mean body mass index in representatives of this group also increases depending on the mean age and duration of the patients' disease (Table 2.1).

(Table 2.1). General clinical characteristics of patients allocated by primary diagnosis of OA in pre- and post-menopausal women (n=105)

Groups	Average age of patients	Duration of the disease (in years)	Average BMI indicator of patients (kg/sm2).
Group I (n =54)	49,5±2,6	3,2±1,2	32,13±2,0
Group II (n=51)	57,1±4,2	5,1±1,2	33,14±4,5

As shown in the figure below, OA accounted for the bulk (75.4%) of women aged 41-50 years when divided by the mean age of the patients. 10.2% of pre- and post-menopausal women with OA were between 51 and 60 years of age, while 5.4% were over 61 years of age (Figure 2.2).

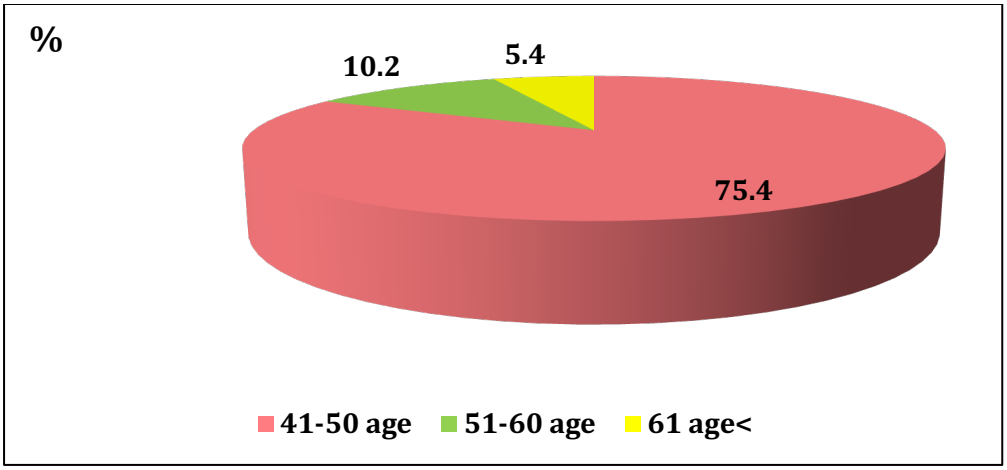


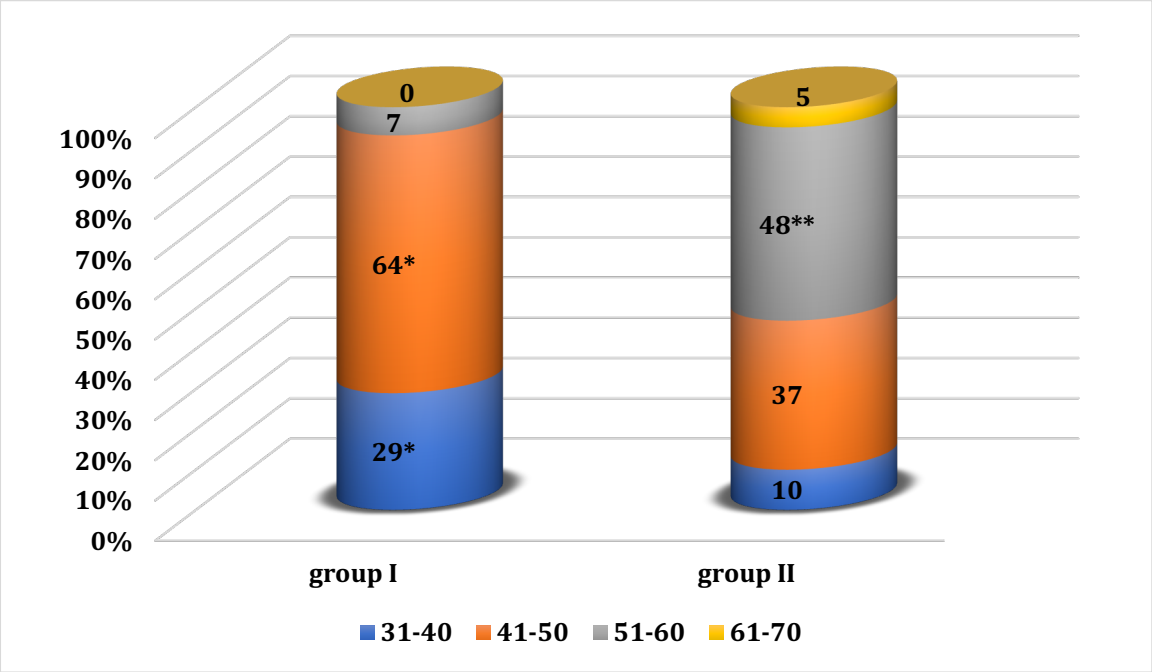
Figure 2.2. Distribution of primary OA patients in Pre - and postmenopausal periods by average age (%)

The average period before this diagnosis with the appearance of the first signs was 8-24 months. During this period, patients consulted doctors with other disorders 5.7±1.3 times. In 25.7% of patients OA was diagnosed only after 1 year, from the appearance of the first signs of the disease up to 9 months, in 15.4% - on average 6 months after the onset of the disease, and in 1/3 of them (32%) OA was diagnosed only after 1 year.

When analysing the general clinical and laboratory parameters of women with primary OA in the pre- and postmenopausal periods, it was noted that the mean duration of morning numbness did not exceed 10.5±5.4 minutes. VAS and Lequene indices were 70.1±1.5 and 16.1±0.4, respectively. Only 24% of patients showed signs of synovitis. The number of painful and swollen joints was 2.8±1.5 and 2.1±0.8, respectively. When examining the functional impairment of the joints, it was noted that the majority of women with OA (54.8%) had functional class II. In 5% of them, on the other hand, the disease indicated that changes in the pelvic joints did not lead to functional failure. Of the indices of

inflammation, there was no strong degree of negative change in the rate of S-reactive protein and erythrocyte sedimentation

In the diagram below, the group distribution of the mean age of women with OA before and after menopause is shown in per cent. According to it, the bulk of group I patients (64%) were women aged 41 to 50 years (p<0.01). The smallest proportion (7%) were patients aged 51 to 60 years. Conversely, women in group II in this age range had an advantage of 48% (r<0.001). They were followed by postmenopausal women aged 41-50 years and (5%) 61-70 years (Figure 2.3).

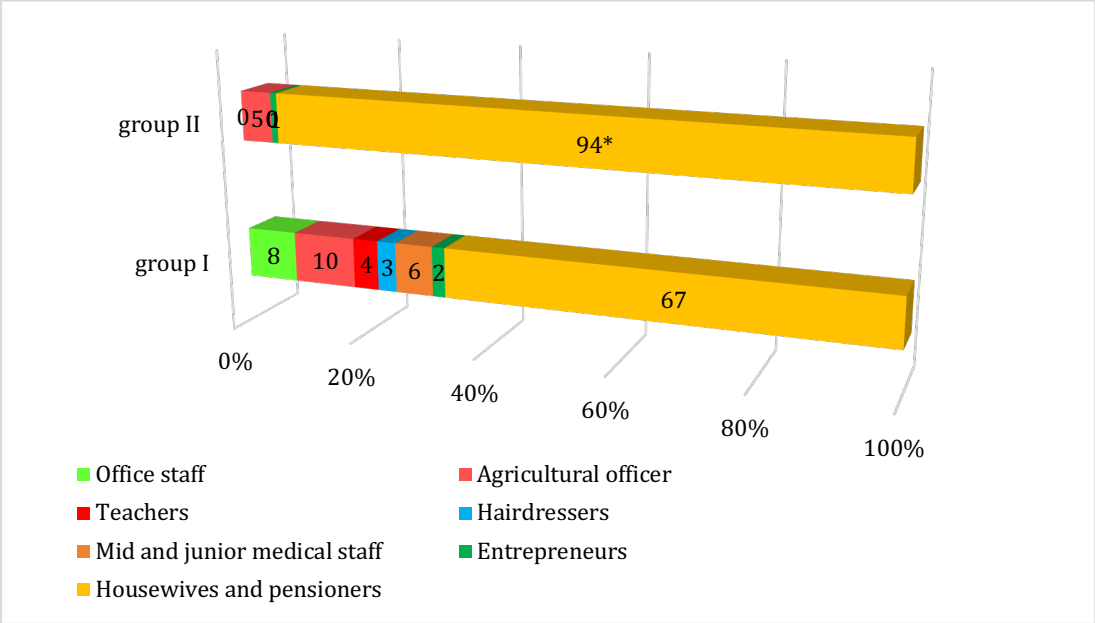


Note: * -R<0.01-- reliable discrepancy with indicators in the group I

*** - R<0,001--** reliable discrepancy with indicators in the group II

Figure 2.3. Group distribution of average age for women with pre - and postmenopausal OA (%)

It is known that among a number of Risk Factors in the origin and development of OA, professional activity also plays a special role. The figure below analyzes the occupational characteristics of women involved in scientific research work and evaluates the levels of development of OA under their influence. According to it, Housewives, pensioners and office workers made up the largest proportion of patients in both groups (67%, 94% and 8%; R<0,001). This is evidenced by the high importance of hypodynamia and the associated metabolic syndrome in the development of the disease. In addition, patients with the disease also include teachers, middle and small medical staff, hairdressers, entrepreneurs and agricultural workers, and this condition is explained by the presence of stagnant static tension that falls on the joints as a result of labor activity (figure 2.4).

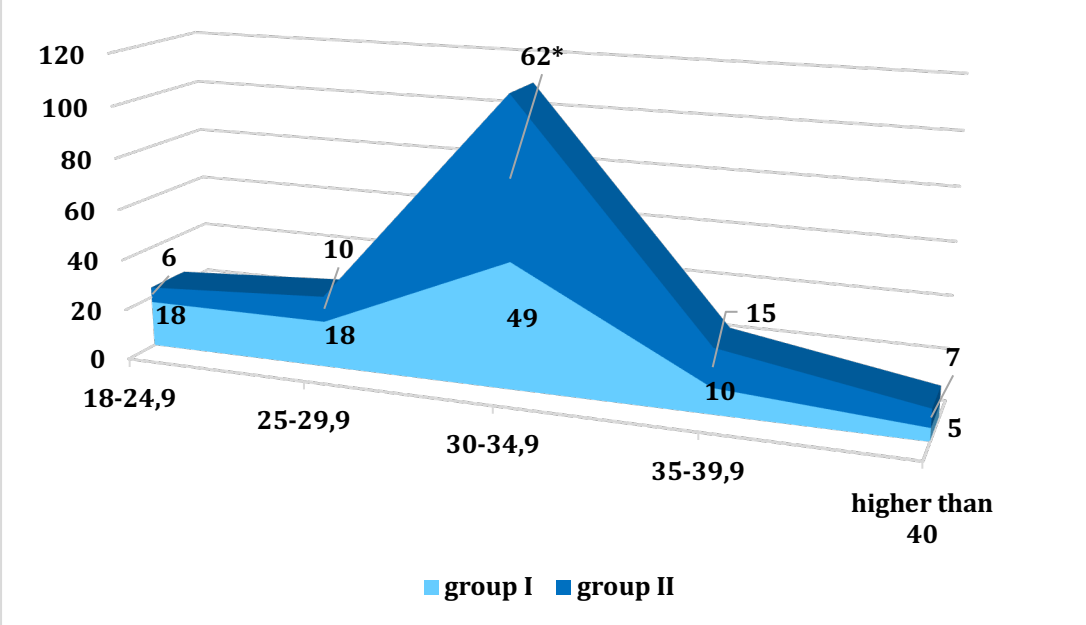


Note: *- R<0.01-- reliable discrepancy with indicators in the group I

2.4.- fig. Group distribution (%) of occupational characteristics of women with pre-and postmenopausal OA

Overweight and obesity as an important risk factor for the development of OA is reflected in much of the literature.

As seen in the case shown in Figure 2.5, the body mass index (BMI) was higher in postmenopausal women compared to premenopausal OA patients. Indeed, we can testify that the incidence of obesity (BMI - 30-34.9) in group II OA women was statistically significantly high compared to group I patients (r<0.5).

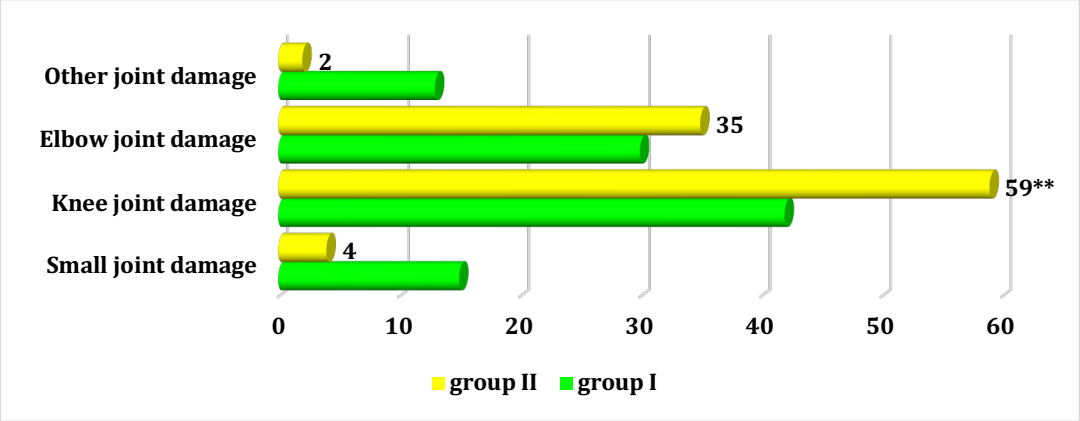


Note: * -R<0,5 - - reliable discrepancy with indicators in the group I

Figure 2.5. Body mass index (%) of OA patients during Pre-and postmenopause

Therefore, during postmenopause, women are prone to excess body mass as well as obesity in relation to the time of premenopause, while it will be possible to conclude that this condition directly increases the likelihood of developing OA and increases the level of Joint Functional insufficiency.

In the image in the diagram below, the localization of joint damage in female patients with OA in both groups is expressed in percentage indicators. Based on the data in it, we can see that the degree of damage to the knee and groin joints in women during postmenopausal period has shown a statistically reliable advantage over Group I patients (r<0.005). OA patients during premenopause, on the other hand, had statistically higher rates of damage to the joints of the arms and legs than Group II patients (R<0.005) (figure 2.4).

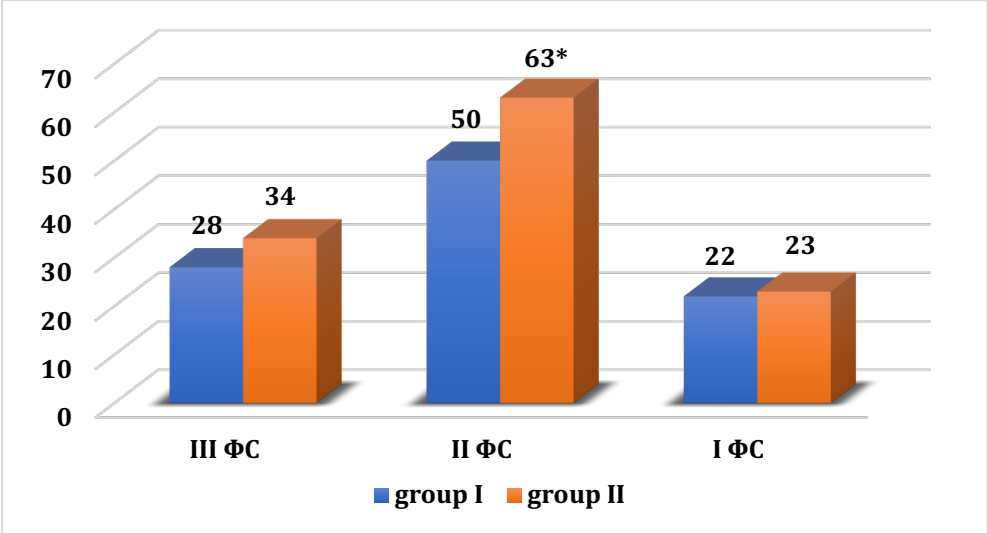


Note: * -R<0,005-- reliable discrepancy with indicators in the group I

**** - R<0.005--** reliable discrepancy with indicators in the group II

Figure 2.5. Distribution according to the localization of joint damage in patients with Pre - and postmenopausal periods (%)

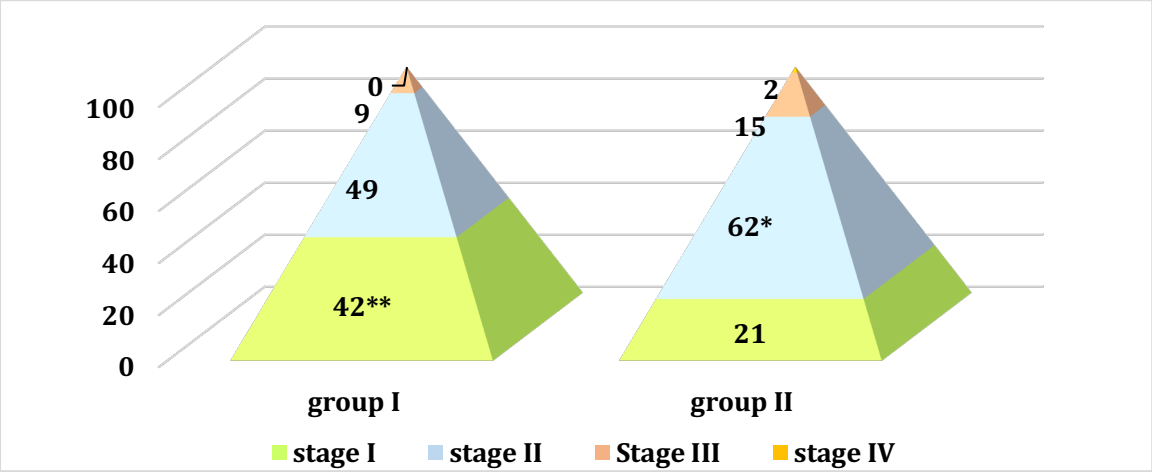
It is known that the functional state of the joints is an important indicator that directly affects the quality of life of patients, and by constantly analyzing it in dynamics, it is possible to assess the clinical-functional state of the joints. In OA female patients involved in the research work carried out, this indicator was also analyzed depending on the period of premenopause and postmenopause. According to him, in 63% of patients of Group II, the II level of Joint Functional insufficiency was noted. This suggests that the functional state of the joints in postmenopausal women is statistically worse than in premenopausal OA patients (50%) (r<0.5). According to the incidence rate of functional classes I and III, no statistical reliable discrepancy between the groups in the observation was detected (figure 2.5).



Note: *- R<0,5- reliable discrepancy with indicators in the group I

Figure 2.6. Group analysis of joint functional status in female patients with pre - and postmenopausal OA (%)

OA patients underwent a standard X-ray for the purpose of analyzing changes in joint structures, which was evaluated in the Kellgren-Lawrence method.



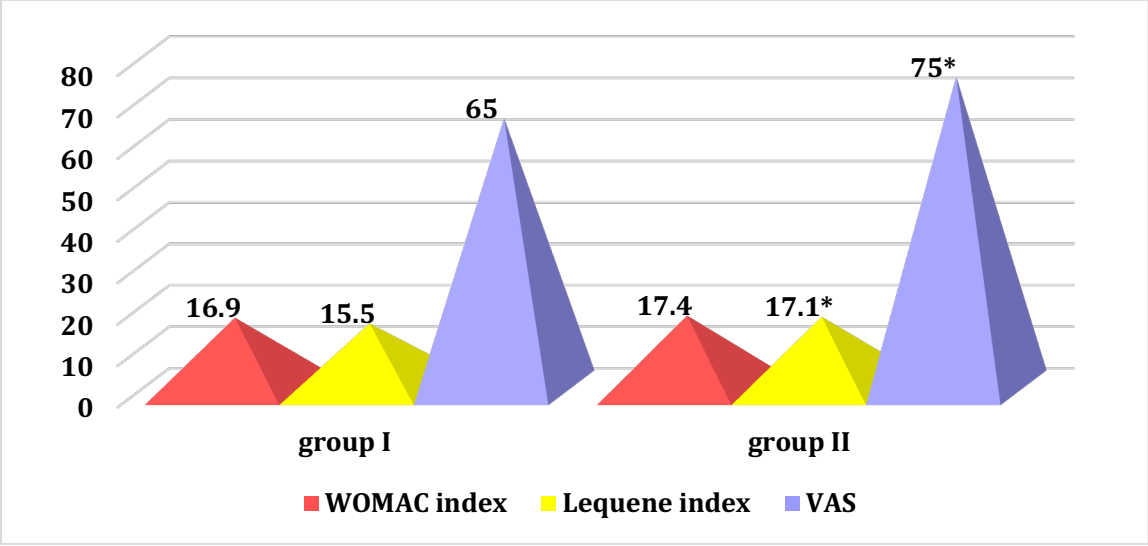
Note: *- R<0,1- reliable discrepancy with indicators in the group I

**- r<0.005- reliable discrepancy with indicators in the group II

Figure 2.7. Group analysis of radiological stages detected in female patients with pre - and postmenopausal OA (%)

According to it, premenopausal women with OA were twice as likely to have radiological phase I compared with postmenopausal group II patients (42% and 21%, respectively) (r<0.005). However, group II patients were statistically more likely to have radiological changes in phase II compared to premenopausal group I patients (62% and 49%, respectively) (r<0.01). In addition, patients in this group also witnessed that phase III and IV radiographs were reported more frequently than women with OA in group I (15% and 9%, 2% and 0%) (3.6.-figure).

WOMAC, Lequene and VAS indices were analysed to assess the clinical activity of the disease in menopausal women with OA.



Note: * -R<0.05 - - reliable discrepancy with indicators in the group I

Figure 2.8. Comparative group analysis of WOMAC, Lequene, and VAS indices in OA women during premenopause and postmenopause (score)

As described in Figure 2.8 above, the lequene and VAS scores of group II patients were statistically higher than those of group I patients (17.1 and 15.5; 75 and 65, respectively) (r<0.5). However, the

WOMAC score did not show statistically significant differences between the groups (16.9 and 17.4, respectively).

Conclusion.

1. Among a number of risk factors for the occurrence and development of OA, occupational activity is also of particular importance.
2. Excessive body weight in menopausal women directly increases the probability of OA development and also increases the level of functional joint insufficiency
3. In female patients with osteoarthritis in the menopausal period, changes in serum levels of estradiol, FSH and LH influence the clinical and laboratory level of disease activity and increase degenerative changes in vertebral joints.

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