QUALITY OF LIFE PATIENTS WITH OSTEOARTHRITIS

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ABSTRACT

The aim of the study was to study the effect of a decrease in bone mineral density (BMD) on the quality of life (QOL) of patients over 65 years of age with various clinical forms of osteoarthritis (OA).

Material and methods. 93 patients over 65 years of age with a diagnosis of OA corresponding to the criteria of R. Altman were examined. Anthropometric indicators, duration of the disease, degree of functional insufficiency were evaluated in all patients, X-ray examination of joints, densitometry were performed. According to the results of densitometry, the patients were divided into two groups. The main group consisted of 69 patients with osteopenic syndrome, the control group consisted of 24 examined with normal

MPKT. In each of the groups, patients with the main clinical forms of OA (according to the most affected joint) were identified: gonarthrosis, oligoarthrosis, polyosteoarthrosis. General (SF-36) and special (WOMAC index) questionnaires were used to assess the quality of life.

The results of the study. According to the results of the SF-36 questionnaire, a decrease in BMD in patients with OA worsens all indicators of QOL, especially the psychological component of health. An increase in the number of affected joints is characterized by a deterioration in QOL. The presence of osteopenic syndrome in elderly patients with OA significantly reduces QOL according to the WOMAC index scales, which characterize the severity of pain in the joints and the functional ability of patients, while the dependence on the clinical forms of OA has not been traced.

Keywords: bone mineral density, osteoarthritis, osteoporosis, old age, quality of life.

INTRODUCTION

Pathology of the musculoskeletal system is one of the most significant medical problems, which is associated with its pronounced impact on health and quality of life (QOL) and, as a consequence, tangible economic damage. Rheumatic diseases (RH) lead to a deterioration of the patient's physical condition, and their chronic progressive course and disability lead to a restriction of social activity. The medical, social and

economic burden on society is primarily associated with osteoarthritis (OA) and osteoporosis (OP). In recent years, the study of QOL has increasingly become the subject of clinical research, since with the help of developed questionnaires it allows to adequately assess the health status of patients and the effectiveness of treatment. QL is defined as an integral characteristic of the physical, psychological, emotional and social functioning of the patient, based on his subjective perception, which allows, in addition, to assess the dynamics of the disease and effectiveness treatment. Although methods of assessing QOL in foreign rheumatology have been used since the 60s of the XX century, there are no uniform criteria and standard standards of QOL; for each region and different population groups, they have a conditional norm by which comparison can be carried out in the future. The currently available questionnaires for the characteristics of QOL allow us to identify the trend of its changes and make comparisons with various nosological forms, while the changes in QOL indicators detected by the questionnaires should be compared with the clinical condition of the patient.

The purpose of this study was to study the indicators of QOL in elderly patients with various clinical forms of OA on the background of osteopenic syndrome.

MATERIALS AND METHODS

93 patients over 65 years of age with a diagnosis of OA corresponding to the criteria of R. Altman were examined. The study was conducted on the basis of the Samarkand City Hospital from 2021 to 2022.

The clinical characteristics of patients with OA in accordance with the clinical classification of V.A. Nasonova are presented in Table. 1. In most patients, the II X-ray stage of the disease and functional insufficiency (FN) of the I degree were detected. With polyosteoarthrosis, a nodular form was diagnosed in 38 (41%) patients.

Indicator	The number of abs patients.	%
Gender		
Male	19	20,3
Female	74	79,7
Age, years		
65-74	40	43
≥75	53	57
Prescription of the disease, years:		
1-4	14	15
5—9	28	30
≥10—14	51	55
Radiological stage:		
Gonarthrosis	27	29
I	5	5,4
II	18	19,3
III	4	4,3
Oligoarthrosis	17	18,3

I	5	5,4
II	9	9,7
III	3	3,2
Polyosteoarthrosis	49	52,7
I	10	10,8
II	28	30,1
III	11	11,8
Functional insufficiency		
Gonarthrosis		
I	21	22,5
II	6	6,5
Oligoarthrosis		
I	15	16,1
II	2	2,2
Polyosteoarthrosis		
I	38	40,9
II	11	11,8

Clinical and instrumental studies have been conducted. Body mass index (BMI) was calculated by the formula: BMI=body weight (kg)/height (m^2).

X-ray examination of joints was carried out on a digital device "Diagnost-94" by Philips. The radiological stages of OA were evaluated based on the classification of J. Kellgren and J. Lawrence

Index	Main group (n=69)	%	Control group (n=24)	%
Gender				
Male	14	20	5	20
Female	55	80	19	80
Age, years				
<75	28	40	13	54
≥75	41	60	11	46
Prescription of the disease, years:				
1-4	12	17,4	2	8,3
5—9	19	27,5	8	33,3
≥10—14	38	55,1	14	58,4
Radiological stage:				
Gonarthrosis	17	24,6	10	42
I	5	7,2		
II	12	17,4	6	25
III			4	17
Oligoarthrosis	10	14,5	7	29
I	5	7,3		
II	4	5,8	4	17
III	1	1,4	3	12
Polyosteoarthrosis	42	60,9	7	29
I	8	11,6	1	4,1

II	27	39,1	2	8,3
III	7	10,2	4	16,6
Functional insufficiency				
Gonarthrosis				
I	14	20,3	7	29
II	3	4,3	3	12,6
Oligoarthrosis				
I	9	13,1	6	25
II	1	1,4	1	4,2
Polyosteoarthrosis				
I	32	46,4	6	25
II	10	14,5	1	4,2
BMI, kg/m^2				
<25	22	31,9	2	8,3
25—29,9	33	47,8	5	20,8
≥30	14	20,3	17	70,9
Height, cm				
150-159	35	51	12	50
160—169	25	36	9	37,5
≥170	9	13	3	12,5
Body weight, kg:				
<70	36	52,2	2	8,3
70—79	19	27,5	5	20,8
≥80	14	20,3	17	70,9
The beginning of menopause, years:				
<43	10	18,2	2	10,5
44-52	36	65,5	11	57,9
≥53	9	16,3	6	31,6
Duration of menopause, years:				
13-19	8	14,5	4	21,1
20—29	32	58,2	13	68,4
30—50	15	27,3	2	10,5

Bone mineral density (BMD) was determined in the distal forearm by two-energy X-ray absorptiometry (densitometer-200 "Osteometer", Denmark). The BMD was evaluated according to the T-criterion (comparison with the peak values of BMD in young people, expressed in standard deviation – CO). According to the recommendations VAS regarded a decrease in BMD according to the T-criterion to -1 CO as a variant of the norm, from -1 CO to -2.5 CO as osteopenia, below -2.5 CO as OP. According to the results of densitometry the patients were divided into 2 groups. The main group consisted of 69 patients with osteopenic syndrome, the control group consisted of 24 examined patients with normal BMD. In each of the groups, patients with the main clinical forms of OA (according to the most affected joint) were identified: gonarthrosis, oligoarthrosis with lesions of the knee and hip joints, polyosteoarthrosis. The groups of patients were comparable in terms of the studied clinical parameters, the main concomitant diseases, while there were significant

differences in the radiological stages of OA and body weight (Table 2). Thus, for patients of the main group, it was characteristic to involve more joints in the process with a smaller radiological stage. To assess QOL, the general (Medikal Outcomes) was used Studi 36-Item Short-Form Health Survey — SF-36) and special (WOMAC — Western Ontario and McMaster Universities Osteorthritis Index, version VA3.1) questionnaires. SF-36 contains 36 questions that make up 8 scales. The scale of Physical Functioning (FF) evaluates self—care, walking, carrying weights, climbing stairs, performing slopes, as well as heavy physical exertion; role-based physical functioning (RFF) - the role of physical problems in the restriction of vital activity; pain (B) — the intensity of pain and its impact on the ability to engage in normal activities; general health (GH) — the patient's condition at the moment and prospects for treatment; vitality (G) — feeling full of strength, energy or, conversely, exhausted; social functioning (SF) — satisfaction the level of social activity; role-based emotional functioning (REF) — to what extent the emotional state interferes with the performance of work or other daily activities; mental health (PZ) — mood, the presence of depression, anxiety. The answers to the questions were expressed in points from 0 to 100, with a higher number of points on each scale corresponding to a higher level of QOL. The WOMAC index consists of 24 questions grouped into 3 sections: pain (5 questions); limited mobility (2 questions); difficulties in performing daily activities during the last 2 days due to OA in the most painful joint (17 questions). The answers are presented in the form of VAS, having the form of a horizontal straight line with a length of 10 cm (0 cm — the absence of a sign, 10 cm — its maximum severity). Higher indicators were regarded as the worst. At the first stage, during the initial examination, QOL indicators in patients with OA were compared with normal and low BMD indicators. At the second stage, the indicators of QOL in various forms of OA were studied.

For statistical processing of the results of the study, the STATISTICA 6.0 software package (Statsoft) was used, which includes calculating the reliability of differences in average values using the Student's t-criteria, the Mann—Whitney U-test and correlation analysis.

RESULTS and DISCUSSION

In patients with OA on the background of osteopenic syndrome, lower values of almost all scales and indicators of the SF-36 questionnaire were noted than in patients with normal BMD, however, statistically significant differences were obtained only on the RFF and REF, FF, SF, PZ, Zh. Statistically significant differences were noted on all scales that make up the psychological component of health, while the greatest differences were revealed for REF — a decrease of 67.6%, SF — a decrease of 21.7%. The difference on the PZ scale was 12%, on the W scale — 10.4%. Among the scales characterizing physical health, the greatest differences were noted for the RFF — a

decrease of 82.7%, for the FF scale the difference was 18.7%. In patients with gonarthrosis, against the background of a decrease in BMD, there was a significant decrease in the assessment on the RFF, PZ, and REF scales. According to the correlation analysis, a significant positive correlation of average strength between the BMD of the distal forearm and the above-mentioned SF-36 scales was revealed. In patients with oligoarthrosis, against the background of a decrease in the BMD of the distal forearm, there was a significant decrease in the indicators of the RFF scale. A positive reliable correlation of the average strength between the assessment on the RFF scale and the BMD of the distal forearm was revealed.

With polyarthrosis, a decrease in most of the indicators of the SF-36 questionnaire (RFF, PP, SF, REF) was noted. In this clinical form, a reliable positive correlation of average strength was determined between the BMD of the distal forearm and the scales of RFF, PZ, REF.

There were no statistically significant differences in most parameters characterizing the severity of the articular syndrome. Nevertheless, in the patients of the main group, there was a significantly greater severity of pain in the affected joints (148.0 ±81.9 points), determined by the WOMAC index, the difference was 21% (in the control — 116.5 ±66.0 points).

When analyzing the items of the WOMAC questionnaire in patients the main group received higher (worse) values for most indicators. There was a significantly greater severity of joint pain at night and in a sitting or lying position. Significant difficulties were noted when walking on a flat surface, lifting from a sitting and lying position, with prolonged standing. Patients with gonarthrosis in the control group had significantly greater difficulties when descending the stairs (in the main group — 52.9±24.8 points, in the control group — 67.5±22.7 points, $p<0.05$). In patients with oligoarthrosis, a significant increase in the severity of sitting/lying pain was revealed (in the main group — 23.2±18.2 points, in the control — 9.17±9.8 points, $p<0.01$). In elderly patients with polyosteoarthrosis, there was no statistically significant deterioration in the values of the WOMAC index and their association with BMD. In patients with gonarthrosis, a statistically significant positive correlation of average strength was established between the degree of FN and the assessment on the scales of pain severity and functional activity of the WOMAC index. In the group of patients with oligoarthrosis, a positive statistically significant correlation was revealed between FN and the scale of functional activity of the WOMAC index, as well as between FN and the parameters of the pain severity scale of this index. In polyosteoarthrosis, there was a positive statistically significant correlation between FN and the WOMAC index scales.

The study of QOL indicators was carried out using general and special questionnaires. In the literature, we have not found data on the effect of a combination

of diseases on the QOL of patients. According to I.A. Onushchenko, T.N. Tsapina, when using the SF-36 questionnaire, a significant decrease in the values of all scales was revealed in patients with OA compared with healthy ones, primarily due to the restriction of RFF and REF. It was also found that the FF and role restriction scales in patients with OA had the lowest values compared to other scales of the questionnaire. In the study, patients with gonarthrosis, coxarthrosis or a combination of them, regardless of the radiological stage of the disease, showed the greatest decrease in indicators on the FF, RF, SF, OZ and B scales compared with the healthy group. In the study, patients with OA with chronic joint pain had lower QOL levels, as well as more pronounced radiological stages of the disease, than patients with intermittent aching pain and the initial stages of OA. In the same study, the authors noted that the health status of elderly patients with knee or hip joint OA significantly worsened in the presence of concomitant diseases. Such patients had an increased risk of psychological distress and physical disability.

Analysis of the scales of the SF-36 questionnaire indicates that in patients with OA against a background of low BMD, all indicators QL was worse than in patients with OA with normal BMD, primarily due to the restriction of RFF and REF. In addition, patients with low BMD showed a significant deterioration in QOL on all scales reflecting the psychological component of health, which indicates a predominant deterioration in the psychological state of elderly patients: restriction of the level of social activity, the presence of depression and anxiety, a feeling of fatigue. There was also a decrease in the QL index on the FF scale.

Nevertheless, in elderly patients with OA, against the background of a decrease in BMD, there was no convincing increase in pain intensity and a change in the patient's assessment of their health status, which confirms the low-symptom clinical picture of osteopenic syndrome.

As you know, the main manifestations of OA are joint pain during exercise and restriction of movement. As the disease progresses, joint pain increases, movement restriction increases, which leads to disruption of various activities. Main the task of treating OA is to reduce the symptoms of the disease, medical and social rehabilitation.

The main reason for the deterioration of QOL in elderly patients with OA against the background of a decrease in BMD is a more pronounced pain syndrome.

According to our data, the use of general questionnaires in elderly patients with OA did not reveal a change in the intensity of pain against the background of low BMD. It's possible explain that the general questionnaires are not specific to OA. Therefore, in order to clarify the functional state, as well as the features of the articular syndrome in patients with OA against the background of a decrease in BMD, we conducted a questionnaire using a special questionnaire. We have not found any works devoted to this problem in the literature.

According to the data obtained in patients with low BMD was marked by a more pronounced pain syndrome in affected joints according to the total index of pain of the WOMAC index, than in patients with normal values of BMD. The total values of the scales "Stiffness" and "Functional ability" in patients of the main and control groups did not differ.

Nevertheless, the analysis of all the items of the WOMAC questionnaire showed significantly greater severity of joint pain in the sitting/lying position and at night in patients with OA with low BMD. The answers to the questions characterizing the indicator "Functional ability" revealed great difficulties with prolonged standing, walking on a flat surface, getting up from a sitting or lying position

in patients of the main group. The severity of stiffness according to the WOMAC index in patients of the compared groups did not significantly differ.

Since QL largely depends on the number of affected joints, the next stage of the study was the study of QL indicators against the background of a decrease

BMD in various clinical forms of OA.

When analyzing the data obtained, there was no convincing dependence of the WOMAC index on BMD in various clinical forms of OA. A detailed analysis of the WOMAC index also showed no significant differences in the absolute majority of the questionnaire items. Only in patients with oligoarthrosis there was a significant increase in the severity of pain in the sitting/lying position. In gonarthrosis, significantly greater difficulty in descending the stairs was recorded in patients of the control group.

Thus, the results of this study there is reason to believe that a decrease in the BMD of the distal forearm in elderly patients with OA is an independent factor leading to deterioration of role functions, restriction of social activity, tolerance of physical exertion and the formation of negative emotions.

CONCLUSION

Thus, a decrease in BMD in patients with OA significantly worsens all indicators of QOL, especially the psychological component of health. An increase in the number of affected joints is characterized by a decrease in the level of QL according to the results of the SF-36 questionnaire. A decrease in BMD in elderly patients with OA significantly worsens QOL according to the scales of special questionnaires characterizing the severity of pain syndrome in the joints and functional ability, while dependence on clinical forms of OA is not traced. The QOL research method allows monitoring the condition of patients with OA, obtaining special data on the patient's functioning in dynamics and using them to assess the effectiveness of treatment, as well as to develop further programs of medical and social adaptation.

Elderly patients with OA need a more thorough examination and selection of medications due to the frequent development and low symptoms of osteopenia.

Currently , bisphosphonates are considered as first-line drugs in the prevention and treatment of OP. Bisphosphonates are synthetic analogues of pyrophosphates, capable of suppressing pathological bone resorption and stimulating the formation of new bone.

The most widely used in clinical practice was alendronate, which belongs to nitrogen-containing bisphosphonates, the mechanism of action of which is associated with the inhibition of the mevalonate pathway of cholesterol synthesis

due to the inhibition of farnesyl pyrophosphate synthetase.

Under the influence of the drug, the synthesis of farnesyl pyrophosphate and geranylgeranyl pyrophosphate, involved in the prenylation of signaling proteins necessary to maintain the structure and function of osteoclasts, is disrupted, which leads to a decrease in their activity and apoptosis, a decrease in bone resorption. Randomized trials have confirmed the clinical efficacy of alendronate for the prevention and treatment of postmenopausal OP, including fractures, therapy of the senile form of the disease (both in women and men) and glucocorticoid OP. Probably, there are no significant sex differences in its effect on BMD in men and women (evidence level C).

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