ISSN 2231-2218

ASIAN JOURNAL OF PHARMACEUTICAL AND BIOLOGICAL RESEARCH

AJPBR

Indexed by:

ROAD Crossref Universal Impact Factor IMPACT FACTOR SEARCH

Asian journal of Pharmaceutical and biological research 2231-2218
http://www.ajpbr.org/
Universal IMPACT factor 7
SJIF 2022: 4.465
Volume 12 Issue 2
MAY-AUG. 2023

Editorial board

Dr. Madhu Bala Scientist 'F' and Joint Director, Institute of Nuclear Medicine and Allied Sciences (INMAS), India

Dr. Sandip Narayan Chakraborty
Research Asst, Translational Molecular Pathology, Ut Md Anderson Cancer Center, Life Sciences Plaza, Houston, TX 77030

Dr. Tushar Treembak Shelke
Head of Department of Pharmacology and Research Scholar, In Jspms Charak College of Pharmacy & Research, Pune, India

Dr. Subas Chandra Dinda
Professor-cum-Director: School of Pharmaceutical Education & Research (SPER), Berhampur University, Berhampur, Orissa, India.

Dr. Jagdale Swati Changdeo
Professor and Head, Department of Pharmaceutics, MAEER's Maharashtra Institute of Pharmacy, S.No.124,MIT Campus,Kothrud, Pune-411038

Dr. Biplab Kumar Dey
Principal, Department of Pharmacy, Assam downtown University, Sankar Madhab Path, Panikhaiti 781026, Guwahati, Assam, India

Dr. Yogesh Pandurang Talekar
Research Associate, National Toxicology Centre

Dr. Indranil Chanda
Assistant Professor, Girijananda Chowdhury Institute of Pharmaceutical Science, Hathkhowapara, Azara Guwahati-17, Assam, India.

Dr. Sudip Kumar Mandal Department of Pharmaceutical Chemistry, Dr. B. C. Roy College of Pharmacy & AHS, Bidhannagar, Durgapur-713206, India.

Sodikova Dilrabokhon Andijan state medical institute

Dr., associate professor Kuryazova Sharofat Tashkent Pediatric medical institute

Dr., Abdurakhmanova Nigora Nazimovna Tashkent Pediatric Medical Institute

Abdullaeva Umida Bukhara state medical institute

Dr. Neeraj Upmanyu
Prof., Peoples Institute of Pharmacy & Research Center, Bhopal, MP, India.

Dr. Mirrakhimova Maktuba Khabibullaevna Tashkent medical academy Uzbekistan

Dr. Nishanova Aziza Abdurashidovna, Tashkent State Dental Institute

Dr. Sadikova Minurakhon Adkhamovna Andijan State Medical Institute

Kurbanova Sanobar Yuldashevna Tashkent State Dental Institute

Zokirova Nargiza Bahodirovna Tashkent Pediatric medical institute

Khabilov Behzod Nigmon ugli Tashkent State Dental Institute

Dr. Domenico De Berardis Department of Mental Health, Azienda Sanitaria Locale Teramo, 64100 Teramo, Italy

Dr. Azizova Rano Baxodirovna associate professor of the Department of neurology of the Tashkent Medical Academy

Dr. Ishankhodjaeva Gulchekhra Tashkent Medical Academy

Institute of Nuclear Medicine and Allied Sciences (INMAS), India
Brig SK Mazumdar Marg, Timarpur, New Delhi, Delhi 110054 India

Asian journal of Pharmaceutical and biological research 2231-2218
http://www.ajpbr.org/
Universal IMPACT factor 7
SJIF 2022: 4.465
Volume 12 Issue 2
MAY-AUG. 2023

THE EFFECT OF WEIGHT LOSS ON THE CLINICAL MANIFESTATIONS OF OSTEOARTHRITIS OF THE KNEE JOINTS

Khairullayeva Gulrukh Saiburkhanovna
Bukhara State Medical Institute, Bukhara, Uzbekistan

Abstract. Obesity consistently associated with the development of a number of chronic diseases, leading to a decrease in quality of life, disability and death. The article examines the connection between obesity and disease of the musculoskeletal system, describes the mechanisms by means of which obesity leads to the development of osteoarthritis. It is evident that reduction of body mass can slow the progression of osteoporosis. The own experience of non-pharmacological and pharmacological treatment of obesity with the use of orlistat in 50 obese patients with osteoarthritis of the knee II–III stage is presented. Treatment has resulted in a decrease in body weight, waist circumference, accompanied by a decrease in symptoms osteoarthritis among all the patients. Our results showed that the addition of orlistat to standard osteoarthritis scheme leads to significant reduction in weight and reduction of clinical manifestations of osteoarthritis. According to the above, the drugs that have impact on weight loss, should be included in the treatment regimen of patients with osteoarthritis and obesity.

Keywords: obesity, osteoarthritis, orlistat.

Introduction. Currently, obesity is considered the largest non-communicable pandemic in the history of mankind. According to the World Health Organization (WHO), there are more than a quarter of a billion obese people in the world, and this figure is steadily growing [1]. In Russia, overweight and obesity occur in 47% of men and 52% of women. Obesity is a heavy economic burden for the state, because, on the one hand, in developed countries, obesity accounts for 8-10% of annual health care costs in general, and on the other hand, obesity leads to an increase in the cost of treatment of almost all diseases. Obesity is currently considered as a socially significant disease [2, 3, 4, 5, 6, 7, 8, 9, 10].

The negative impact of being overweight on human health has been known since the time of Hippocrates, who noted that "Sudden death is more characteristic of the obese than for the thin." Nevertheless, modern ideas about normal body weight began to form only from the 30s of the twentieth century. Prior to this period, the so-called diseases of civilization were not a significant problem for medicine, which struggled with infectious diseases. With an average life expectancy of less than 40 years, the effect of overweight could not be the object of research.

Obesity, being a chronic disease, poses a serious threat to health and is accompanied by the development of such serious diseases as type 2 diabetes mellitus, arterial hypertension, coronary heart disease, myocardial infarction, colon and rectal cancer, and in women also cancer of the cervix, ovaries, mammary glands. Obesity leads to impaired respiratory function due to the limitation of the amplitude of respiratory movements, and fat accumulated in the chest restricts the mobility of the

diaphragm, which causes shortness of breath with moderate physical exertion. Shortness of breath is the most common complaint of obese people. Obesity is the main cause of people's limited mobility and ability to work. Overweight and obesity are also involved in damage to the musculoskeletal system, including the development of osteoarthritis, inflammatory joint diseases, pain in the lower back, as well as a decrease in physical activity and work capacity [3, 11, 12, 13, 14, 15, 16].

The association between obesity and osteoarthritis (OA) is quite well known, in particular, the effect of obesity on the function of knee joints and, to a lesser extent, hip joints has been shown.

With increased body weight (BMI more than 25 kg/m2), an increase in the frequency of knee joint OA is noted, and with a BMI greater than 27.5 kg/m2, a faster radiological progression of knee joint OA is noted [4, 17, 18, 19].

In Japan, a significant association of OA with obesity in women was established: the risk of developing gonarthrosis in obesity was 2,196 times higher than the risk in women without obesity. No such connection was observed in men [8].

Thus, there is no doubt that overweight and obesity are associated with OA.

OA ranks first in prevalence among joint diseases, which affect at least 20% of the world's population. According to rheumatologists in Europe and the USA, this disease accounts for up to 69-70% in the structure of all rheumatic diseases. According to S. Parrot and C.J. Menkes, radiological manifestations of OA occur in 50% of the European population over 65 years of age, and in persons over 80 years of age, OA is detected in almost all patients [9].

Objectives of the study:

• to determine the effect of weight loss on the clinical manifestations of osteoarthritis of the knee joints (pain, stiffness, joint function);

• to study the quality of life of this category of patients.

Materials and methods. The main objective of the study was to evaluate the effectiveness of therapy with the original orlistat drug in relation to weight loss in patients with osteoarthritis of the knee joints of stage II–III for 6 months.

The study design is an open comparative randomized study of the efficacy and safety of orlistat (xenical) in patients with osteoarthritis of the knee joints of stage II–III and obesity.

The study involved 50 women aged 45 to 65 years with tibiofemoral osteoarthritis of the knee joints (according to ACR criteria) II–III art. according to Kellgren-Lawrence, meeting the inclusion criteria (BMI>30 kg/cm2, pain when walking in the knee joints on a visual analog scale (VAS) more than 40 mm, waist circumference (FROM) ≥80 cm). Exclusion criteria from the study: knee injury in the period up to 3 months before the start of the study, intra-articular administration of any drugs within 6 weeks before the start of the study, clinical signs of knee synovitis, secondary gonarthrosis, contraindications to taking orlistat (malabsorption syndrome, cholestasis, hypersensitivity to the drug or its components), diabetes

mellitus 1 and Type 2 in the stage of decompensation of carbohydrate metabolism, lack of written consent for the patient's participation in the study.

The patients were randomized into 2 groups. Randomization of patients was carried out according to the following principle: first, second (odd patients received the drug "Xenical" plus non–drug weight loss with diet and lifestyle changes; even - only non-drug methods of weight loss (diet and lifestyle changes). Each patient signed an informed consent.

Group 1 (25 patients) took the drug orlistat "Xenical" at a dose of 120 mg (1 capsule) 3 times a day (immediately before meals, during meals or no later than an hour after meals) for 6 months in combination with a hypocaloric diet and lifestyle changes against the background of standard treatment regimens for OA.

Group 2 (25 patients) – non-drug therapy of obesity (hypocaloric diet in combination with physical activity) with a standard treatment regimen of JSC.

Non-drug therapy in both groups consisted of diet therapy and the performance of a set of exercises. All patients were recommended a hypocaloric diet with a caloric deficit of 500-600 kcal compared to the calculated indicator, with a fat content of < 30%, carbohydrates of 50-55%, proteins of 15-20%. Each patient filled out a nutrition diary for 6 months, where the daily diet, calorie content, and amount of fat in grams were indicated. An endocrinologist's consultation was also held, where the correction of the diet and recommendations on the dosage of physical activity were discussed. All patients were given explanations on lifestyle changes. Against the background of diet therapy, patients were recommended to take measures aimed at increasing motor activity. Explanations were given on the implementation of isometric exercises that contribute to strengthening, endurance and muscle strength. A set of exercises aimed at strengthening the quadriceps femoral muscle is also shown.

The evaluation of the effectiveness of the study was carried out according to the following parameters:

1. dynamics of changes in the WOMAC index (pain, stiffness, functional insufficiency);

2. decrease in body weight (in % of the initial), as well as indicators of (cm), (cm) and / or after 6 months

of treatment;

3. assessment of the quality of life on a visual analog scale (VAS).

The visits were carried out on an outpatient basis at the Bukhara Regional Multidisciplinary Medical Center on a monthly basis for 6 months.

Monthly anthropometry was carried out: height, weight, determination of body mass index (BMI), waist circumference (FROM), hip circumference (ABOUT) and ratio FROM / ABOUT. The WOMAC questionnaires were filled out, the quality of life was assessed on the VASH scale.

The determination of BMI in patients was carried out according to the WHO recommendation, based on the classification of body weight by BMI (WHO, 1997,

Asian journal of Pharmaceutical and biological research 2231-2218
http://www.ajpbr.org/
Universal IMPACT factor 7
SJIF 2022: 4.465
Volume 12 Issue 2
MAY-AUG. 2023
Table No. 2). BMI was calculated by dividing the body mass index in kilograms by the human height index expressed in meters and squared (kg/m2).

In the study, to determine the effectiveness of the therapy, the WOMAC index (Western Ontarioand McMaster University) was used – a questionnaire for self–assessment of the severity of pain (at rest and walking – 5 questions), stiffness (duration and severity - 2 questions) and functional insufficiency in daily activities (17 questions). The assessment is carried out according to YOUR in centimeters – from 0 (no symptoms / restrictions) to 10 (maximum severity of symptoms / restrictions), then all indicators are summed up.

The quality of life (the patient's state of health) was determined by a visual analog scale (VAS) from 0 to 100 mm, where the number 100 indicates the best state of health that can be imagined, and the worst state of health is indicated by the number 0.

Static analysis was carried out using the STATISTICA 6.0 application software package. Data processing was carried out using descriptive statistics methods, the Student's criterion was used to compare groups. The differences were considered statistically significant at $p<0.05$.

Results and their discussion. 40 patients completed the study. It should be noted that group II patients who are only on non-drug therapy for obesity have repeatedly refused to continue participating in the study after the 2nd visit, citing the ineffectiveness of diet therapy alone in relation to pain in the knee joints. In this connection, the recruitment of patients in the second group was difficult. All the patients who dropped out were excluded from the study and were replaced.

Weight loss was determined in both groups (the dynamics of weight loss is shown in Figure 1). Weight loss was more pronounced in the group of patients on Xenical therapy by 9.05% (on average by 9.5 kg), compared with patients who were only on a hypocaloric diet, where weight decreased by 1.02% (on average per 1 kg) ($p= 0.05$).

In group 1 patients, after 3 months of treatment, a weight loss of 5.8% was determined compared to the initial body weight.

The same changes were observed in BMI. In group 1, BMI decreased by 9% and amounted to 36.9±4.5, which is significantly lower than in group 2, where the body mass index decreased by only 1.8% ($p<0.05$).

In group 1, 52% of patients had grade III obesity, 39% – grade II obesity and 8.7% – obesity of the first degree. Against the background of Xenical therapy, the number of women with grade III obesity decreased by 15%.

In both groups, a decrease in waist and hip circumference was noted against the background of obesity therapy. As a result of Xenical therapy, the waist circumference in group 1 decreased by 7%, in 15 people the waist circumference decreased by more than 6.4cm ($p<0.05$). While in the 2nd group, the waist circumference decreased by only 2.7%, on average by 3 cm compared to the data at

the beginning of the study. Hip circumference in group 1 decreased by 7.8%, in group 2 - by 5.4% (p=0.05).

As a result of the treatment, we noted changes in the functional index of WOMAC. The WOMAC pain (Fig. 2) in patients undergoing Xenical therapy decreased by 52%, and was significantly lower (p=0.006) than in group 2, where this indicator decreased by only 32.4%.

Stiffness in the most painful knee joint as a result of treatment was significantly (p=0.001) lower in the group of patients receiving Xenical therapy. In dynamics, this indicator in the 1st group decreased by 47.4%, and in the 2nd group - by only 36.5%.

The same changes were observed in functional insufficiency: in dynamics, this indicator in group 1 was significantly lower than in group 2 (p=0.003) (a decrease of 51.3% and 33%, respectively).

After 6 months of therapy, the total WOMAC index on the background of weight loss decreased in both groups (by 51% and 33%, respectively), but was significantly lower in the group receiving Xenical (p=0.002). In group 1, the dynamics of the decline in the WOMAC index was determined after 3 months of therapy, this indicator decreased by 36% compared to the baseline data.

Against the background of obesity therapy, the quality of life of patients in both groups became higher. In the group of women with gonarthrosis and high BMI who are on medication for obesity, there was a significant improvement in the quality of life compared to patients with less weight loss (p<0.001).

Our results showed that the addition of Xenical to standard OA therapy leads to a marked weight loss and a decrease in clinical manifestations of OA. Therefore, drugs that affect weight loss should be included in the treatment regimen of patients with OA and obesity.

References

1. Anandacoomarasamy A, Caterson I, Sambrook P, Fransen M, March L. The impact of obesity on the musculoskeletal system. Int J Obes 2018;32(2):211– 222. doi: 10.1038/sj.ijo.0803715.

2. Pelliter JP, Raynauld JP, Berthiaume MJ. Risk factors associated with the loss of cartilage volume on weight-bearing areas in knee osteoarthritis patients assessed by quanti-tative magnetic resonance imaging: a longitudinal study. Arthr. Res. Ther 2017;9:74.

3. Liu B, Balkwill A, Banks E, Cooper C, Green J, Beral V. Relationship of height, weight and body mass index to the risk of hip and knee replacements in middle-aged women. Rheumatology 2017;46(5):861–867. PMID: 17282995. doi: 10.1093/rheumatology/kel434.

4. Lübbeke A, Moons KGM, Garavaglia G, Hoffmeyer P. Outcomes of obese and nonobese patients undergoing revision total hip arthroplasty. Arthritis Rheum 2008;59(5):738–745.PMID: 18438918. doi: 10.1002/art.23562.

5. Inoue R, Ishibashi Y, Tsuda E, Yamamoto Y, Matsuzaka M, Takahashi I, et al. Medical problems and risk factors of metabolic syndrome among radiographic knee osteoarthritis patients in the Japanese general population. J Orthop Sci 2021;16(6):704–709. PMID: 21915668. doi: 10.1007/s00776-011-0157-9.

6. Abdullaeva U.K., Sobirova G.N., Karimov M.M., Aslonova I.J The prevalence and possibilities of prevention of noncardial gastric cancer in the Bukhara region // American journal of medicine and medical sciences. 2020. Vol. 10. Iss. 9. P. 679-681.

7. Abdullaeva U.K. Predicting the risk of atrophic transformation in chronic gastritis using serum pepsinogen // World journal of pharmaceutical research, Faculty of Pharmacy Medical University, Bulgaria. 2019. Vol. 8. Iss. 13. P. 219-228.

8. Abdullaeva U.K., Shadjanova N.S. Using the OLGA system in chronic atrophic gastritis // New day in medicine. 2020. Iss. 13. P. 9-12.

9. Abdullayeva U.K. The value of interactive teaching methods in improving the level of clinical knowledge of students // Medical education and professional development. 2019. Vol. 1. Iss. 33. P. 29-33. (in Russian)

10. Abdullaeva U.K. Predicting the risk of atrophic transfusion in gastritis with chronic chelicobacter // Tashkent. Abstract of PhD dissertation. 2021. P.1-46. (in Uzbek)

11. Abdullaeva U.K. Opportunities to prevent atrophic changes in the gastric mucosa in the Bukhara region // Journal bulletin of the doctor. 2020. Vol. 1, Iss.31. P. 7-11. (in Uzbek)

12. Abdullaeva U.K. Retrospective analysis of gastritis associated with chronic atrophic H. pylori in patients with nocardial gastric cancer in bukhara city and prevention of atrophic processes of gastric mucosa // Interdisciplinary Approaches to Medicine. 2022. Vol. 3, Iss.2. P. 10-13.

13. Abdullayeva U.K., Shadmanov M.A. A new approach to the treatment of ulcerative colitis // Art of Medicine. International Medical Scientific Journal. 2022. Vol. 2, Iss.1.

14. Abdullayeva U.K., Shadmanov M.A. New aspects of the diagnosis of ulcerative colitis // British Medical Journal. 2022. Vol. 2, Iss.1.

15. Abdullayeva U.K., Rakhimova M.B. Clinical-anamnestic features of patients with H. pylori-assoculated chronic gastritis in the Bukhara Region // Biology. 2022. Iss. 5. P. 139. (in Uzbek)

16. U.K. Abdullaeva Regional causes of extrahepathic subtransaminasemias // Journal of Problems of Biology and Medicine. 2018. Vol. 3. Iss. 102. P. 8-10. (in Russian)

17. Abdullayeva U.K., Zhalolova V.Z. To study the effectiveness of cholelitolytic therapy in patients with gallstone disease, taking into account the type of violation of the contractility of the gallbladder // Bulletin of the Council of Young

Scientists and Specialists of the Chelyabinsk region. 2016. Iss. 4 (15). P. 4-6. (in Russian)

18. Abdullayeva U.K. Results of morphological and endoscopic examination in chronic gastritis // Journal of theoretical and clinical medicine. 2022. № 3. P. 46-49. (in Uzbek)

19. Abdullayeva U.K., Mirzayeva D.B. Regional perspectives of metabolic therapy of stable angina pectoris // Kazakstan Republican scientific journal “Vestnik” 2019. Vol. 1. Iss. 85. P. 74-75. (in Russian)