Spectrum Journal of Innovation, Reforms and Development
Volume 24, February, 2024 | ISSN (E): 2751-1731
Website: www.sjird.journalspark.org

CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND ANEMIA

Yarmatov Suvon Tatlibayevich
Samarkand State Medical University, Samarkand, Uzbekistan

Abstract
Anemia refers to manifestations of systemic inflammation in chronic obstructive pulmonary disease (COPD) and is an aggravating factor in the course of the disease. Goal. To study the gender characteristics of anemia in COPD patients, to increase the effectiveness of treatment by using pharmacological preparations of erythropoietin and enteric iron. Material and methods. The clinical data of the examination of 74 patients with stage II and III COPD with anemia and the results of treatment of 49 patients who received epoetin and sorbifer durules in addition to standard therapy are presented. Results. In COPD patients with anemia, iron deficiency anemia was statistically significantly more common — in 63 (85.1%): in 39 (61.9%) women and 24 (38.1%) men. In 11 (14.9%) patients, normochromic normocytic anemia was verified, which has the parameters of anemia of chronic diseases. The frequency of iron deficiency anemia in patients of both sexes correlated with age, was predominantly moderate; at the same time, the average severity was statistically more often confirmed in women — 24 (61.5%) out of 39 patients, in men the mild variant of iron deficiency prevailed — 14 (58.3%) out of 24 patients. Conclusion. The prevalence of concomitant anemia in COPD was 26.5%; at the same time, anemia was verified in 44 (33.7%) women, i.e. in every third patient, anemia was significantly less common in men — in 30 (20.7%) patients. The presence of anemia significantly worsens the condition of patients, especially women, who They are more concerned about shortness of breath, impaired well-being, fatigue, depression, and they need more frequent hospitalizations. Correction of anemia with erythropoietin and enteric iron preparations allows to increase the physical endurance of patients, reduce the intensity of cough, shortness of breath and maintain positive dynamics of physical tolerance for a long time after completion of the course of antianemic therapy.

Keywords: chronic obstructive pulmonary disease; anemia; gender differences.

Introduction

Chronic obstructive pulmonary disease (COPD) is one of the leading causes of morbidity and mortality in the world, leads to significant and constantly growing economic and social damage, and requires the introduction of modern treatment technology. Research on the gender aspects of COPD is still in its infancy, but these initial steps are already giving great hope to scientists and practitioners. The diagnosis of COPD is increasingly being made to middle-aged women who smoke moderately or not at all. Every year, the number of new cases of COPD in The female population increases approximately 3 times faster than that of males. The study of the features of the course of COPD in women allows us to identify another phenotype of the course of COPD — the "female sex". One of the most important systemic manifestations COPD is the development of anemic syndrome. Information on the prevalence of anemia in COPD is contradictory and ranges from 8 to 53%. It is necessary to develop principles and tactics for the treatment of COPD patients

with anemia syndrome, which makes it possible to optimize comprehensive medical care for patients and improve the prognosis diseases. The aim of the study was to study the gender characteristics of anemia in COPD patients, to increase the effectiveness of treatment through the use of pharmacological preparations of erythropoietin and iron preparations.

MATERIALS AND METHODS OF RESEARCH

The work is based on the results of examination of 74 patients diagnosed with stage II and III COPD with anemia (44 women and 30 men, average age 67.1±10.9 years) who met the criteria for inclusion in the main observation group, and the results of treatment of 49 patients who received epoetin beta (EPO) and sorbifer durules in addition to standard therapy. EPO was administered subcutaneously at the rate of 50 IU/kg 3 times a week to achieve normal hemoglobin levels, then a maintenance individual dose of EPO was prescribed weekly for 3 months. Sorbifer durules was prescribed only if the iron deficiency nature of anemia was confirmed. The course of treatment with a full dose of iron was carried out for 3 months. The correction phase had a different duration depending on the individual iron deficiency. To prevent iron overload, ferritin, transferrin, and hemoglobin values were determined once a week in the correction phase and once every 4 weeks in the stabilization phase (3 months) and for 12 months of follow-up. To study the gender characteristics of patients COPD with anemia was compared with the results of observation of 55 patients of the control group (29 men and 26 women) diagnosed with COPD of stage II and III without anemia syndrome. The groups were comparable in terms of basic anthropometric, clinical and anamnestic indicators, standard therapy received, and instrumental examination data. Criteria for excluding patients from the study: extremely severe COPD, bronchial asthma, malignant or hematological disease, autoimmune disease, cirrhosis of the liver, theophylline use, the presence of chronic renal failure, established sources of bleeding (complications of peptic ulcer disease, ulcerative colitis, etc.) and previously diagnosed anemia (megaloblastic, aplastic, hemolytic), EPO therapy, dministration of iron preparations or blood transfusion for 3 months before inclusion in the study. Criteria for inclusion in the main study group: the presence of reliable clinical and instrumental signs of COPD of stage II and III, according to GOLD criteria 2011; presence of hematological criteria for anemia (WHO, 2001): hemoglobin level less than 130 g/l in men and less than 120 g/l in women; presence of absolute iron deficiency; at the same time, the level of ferritin reduction is less than 10 mcg/l in women and less than 20 mcg/l in men, increased transferrin levels of more than 3.8 g/l; voluntary written consent of the patient to participate in the study. A subjective assessment of cough and shortness of breath was performed using a visual analog scale (VAS) and a Borg scale. To study the dynamics of tolerance to A 6-minute walking test (TSHMX) was used before and after treatment to exercise and objectify the functional status of patients. At the same time, possible gender differences in the effectiveness of the therapy were clarified. Statistical processing of the results was carried out in Microsoft Excel and Statistica 6.0 programs. The average value, standard deviation, reliability of differences and Student's criterion were calculated. The critical significance level (p) was assumed to be 0.05.

THE RESULTS AND THEIR DISCUSSION

Among 277 patients with COPD of stage II and III (130 women and 147 men), anemia was detected in 74 patients according to hemogram data and in full accordance with the criteria for inclusion in the main study group. The diagnosis of anemia was verified in all patients for the first

time. Thus, the prevalence of anemia in COPD, according to our data, was 26.5%. At the same time, among women diagnosed with COPD stages II and III, anemia was confirmed in 44 (33.7%) patients, i.e. in every third patient, anemia in men was significantly less common — in 30 (20.7%) patients ($p < 0.05$). In the main group, there were statistically more women aged 40 to 60 than men of the same age: 21 (47.7%) women and 7 (23.3%) men; while in the older age group (from 71 to 80). There were significantly more men with anemia than women (14 (46.7%) men and 12 (27.3%) women ($p <0.001$). The average age of women with COPD with anemia was less than that of patients in the control group: 59.1±7.8 and 65.7±6.7 years. The average age of men in the comparison groups did not significantly differ (71.3±8.5 and 3.3±7.7 years, $p \geq 0.05$). Gender dimorphism was also revealed when assessing the severity of the underlying disease against the background of anemia. In the main group, severe stage III COPD in women was more common than in men (59.3% vs. 40.7%, $p < 0.05$), in the control group of severe male patients there were statistically more than female (71.4% vs. 28.6%, $p < 0.05$). When analyzing the anamnesis data, women of the main group on average considered themselves sick for 14.5±2.1 years, whereas in the group of men this indicator was significantly higher — 24.7±2.6 years ($p < 0.01$), in patients of the main group the duration of the disease from the moment of the first symptoms (cough in the morning, sputum separation) to The occurrence of symptoms of respiratory difficulty averaged 6.5±2.9 years in women and 22.4±8.9 years in men ($p < 0.05$). The average age of smoking initiation in women and men in both groups did not significantly differ and amounted to 25.6±5.6 and 23.5±4.7 years, respectively, Among non-smoking women, 22.7% noted the presence of such a factor as long-term (more than 15 years) secondhand smoke. No former smokers were registered among women, and 17.4% of men were former smokers. Our study analyzed the prevalence of concomitant diseases in COPD patients with anemia. In the whole group, 65 (92%) patients had concomitant diseases (on average, 9±2.1 chronic diseases per 1 patient). Sexual dimorphism was reliably confirmed: the number of comorbid conditions in women was higher than in men ($p < 0.01$). Men are more likely to suffer from coronary heart disease, atherosclerosis, arrhythmias, women are more likely to suffer from concomitant hypertension, depression, bronchial asthma, thyroid diseases. A comparative analysis of the anamnesis data revealed that 20.5±3.5% of women in the main group had frequent exacerbations of COPD (3 times or more per year), this parameter was recorded only in 10.4±1.3% of men. The gender specificity of complaints was characterized by the fact that in women with COPD with anemia, subjective feelings of fatigue, irritability, depression occurred significantly more often (70.2% versus 55.3% in men), at an earlier time and were characteristic of the age group from 40 to 60 years. In general, in patients with COPD and anemia, the severity of shortness of breath was higher than in patients with COPD without anemia (6.9±0.7 and 4.8±0.9, $p < 0.05$). At the same time, gender dimorphism of the severity of dyspnea was also revealed: in women with COPD, on average, the dyspnea index was significantly higher than in men and amounted to 6.8±0.7 points (in men 4.9±0.5 points, $p < 0.05$). Women had a significantly lower body mass index than men in the main group (21.43±2.8 kg/m2 versus 24.68±1.7 kg/m2, $p < 0.05$). Bronchial conduction disorders of the obstructive type were detected at the level of both central and peripheral airways. Women had lower values of all indicators of respiratory function — FVD. According to the survey, hypochromic microcytic iron deficiency anemia (IDA) was statistically significantly more common in COPD patients with anemia — in 63 (85.1%) patients, mainly in women — in 39 (61.9%, $p < 0.05$). In 11 (14.9%) patients with a slight predominance of males (6 men and 5 women), normochromic normocytic anemia was

verified, having the parameters of anemia of chronic diseases (AHZ). The incidence of IDA in patients of both sexes correlated with age, anemia was predominantly moderate — in 34 (54%) patients; at the same time, the average severity was statistically more often confirmed in women — in 24 (61.5%) of 39 patients, in men the mild variant of iron deficiency prevailed — in 14 (58.3%) of 24 patients ($p < 0.01$). The degree of activity of the systemic inflammatory process in patients of the main group with IDA is higher than in patients without concomitant anemia; at the same time, a higher degree of activity is more often recorded in women than in men. An inverse correlation was found between the level of C-reactive protein and the indicators of emoglobin and hematocrit ($r = -0.37$, $p < 0.05$). Hemogram indices in IDA have gender dimorphism, which consists in the fact that with mild anemia in men, hemoglobin (120.4±5.1 g/l) and hematocrit (35.5±1.4%) were significantly higher than in women (100.7±10.2 g/l, 29.3±2.3%, $p < 0.05$). With anemia of moderate severity, these indicators did not have significant differences. There was no iron deficiency in AHZ, and there were no gender differences in hematological parameters. The frequency of AHZ in COPD patients of both sexes correlated with age, was statistically more common in patients over 60 years of age — in 9 (81.8%) patients and was predominantly mild in 7 (63.7%) patients ($p < 0.05$). The severity of anemia in the whole group was minimal — in 38 (51%) of 74 COPD patients with anemia, a statistically unreliable predominance of moderate anemia was noted. It can be concluded that both mild and moderate anemia occur equally in patients with COPD. A direct correlation was revealed between the indicators of FEV1, hemoglobin, hematocrit in anemia of both mild and moderate severity without gender differences: FEV1 (Hb: $r = 0.37$—0.75; FEV1: $r = 0.45$—0.77 — mild anemia; Hb: $r = 0.35$—0.78; FEV1: $r = 0.45$—0.79 — anemia of moderate severity, $p < 0.01$). Against the background of treatment with EPO and sorbifer durules, hemoglobin increased significantly by 18% ($p < 0.05$), hematocrit by 6.8% ($p <0.05$), erythrocytes by 18% ($p < 0.05$), iron by 56% ($p < 0.05$), ferritin — by 10.8% ($p < 0.05$), decreased the level of transferrin increased by 21% ($p < 0.05$), and OHSS — by 22%. There was no gender dimorphism in the initial characteristic of cough in the main observation group, but after 3 months of therapy, cough indices on the VAS scale decreased from 8 (8; 9) to 5 (5; 6) points and after 12 months of observation remained at a lower level compared with the initial values — from 8 (8; 9) to 6 (7; 8), in the control group, cough indicators did not significantly differ from the initial values — 8 (8; 9) points. Evaluation of the results of the Borg dyspnea study after completion of antianemic therapy revealed a decrease in this indicator in both men and women of the main group ($p < 0.05$). At the same time, in women, this indicator significantly differed from the dynamics of positive changes in men: there was a decrease in shortness of breath from 7.5 to 5 points, in men, the dynamics of shortness of breath was 5.4 points versus 4.2 points. After 12 months of follow-up, the observed pattern of positive dynamics was confirmed and the indicators of shortness of breath remained at a level lower than the baseline values in both women and men of the main group; in patients of the control group , the indicators did not significantly differ from the baseline data. A direct correlation was obtained between changes in the Borg dyspnea index (ΔBorg) and changes in hemoglobin (ΔHb) and hematocrit (ΔHt) indices in the dynamics of treatment: for ΔBorg and ΔHb, $r = 0.71$ ($p = 0.009$); for ΔBorg and ΔHt, $r = 0.8$ ($p = 0.0014$). A comparative assessment of the results of TSHMH showed that after 3 months in the main group, exercise tolerance increased by 15.5%, in the control group — by 4.1%. In the study of TSMH indicators after 12 months, it was found that, compared with the baseline data, exercise tolerance increased by 6.7% in patients of the main group, and no significant differences from the baseline

values were obtained in the control group. Gender specific features the dynamics of TSHMX indicators have not been revealed. The average frequency of COPD exacerbations during the year in patients of the main group decreased in women from 4.2 to 2.2 per year, in men from 2.8 to 1.5 ($p < 0.01$). At the time of completion of the study, the group of patients receiving antianemic therapy was dominated by patients without exacerbations compared with the control group (54.6% vs. 34.1%, $p < 0.05$). In accordance with national and international recommendations for the diagnosis and treatment of COPD, it is necessary to timely verify the entire complex of systemic manifestations of the disease, including anemia. The available data on the prevalence of anemia in COPD patients are presented ambiguously and often contradictory. The results of our work show that anemia in COPD patients is widespread and occurs in 26% of patients. The difference in prevalence estimates is probably due to the fact that the average age of patients in previous studies averaged 61 years, the cohort of patients in this study was in a significantly larger age range — from 40 years to 81 years. In addition, the underestimation of this indicator can be explained by the following, that a limited set of laboratory criteria was used for diagnosis: hemoglobin, erythrocytes and hematocrit. We used a set of parameters recommended by WHO and the national guidelines on hematology, which allows not only to diagnose anemia taking into account gender characteristics, but also to determine its form and severity. Previous studies indicate that neither the age nor the indicators of FVD in patients with anemia and without anemia syndrome differ. According to our data, the presence of anemia correlates with age, spirometry parameters and is associated with more severe clinical manifestations of COPD. The results obtained indicate the late diagnosis of anemia syndrome in COPD patients and the lack of necessary comprehensive treatment. A large proportion of women suffering from COPD with anemia, identified in As a result of the study, it reflects the global trend towards an increase in the incidence of COPD in women; at the same time, anemia forms in women at an earlier time and is more severe than in men. Timely and adequate antianemic therapy can improve the condition of patients, reduce the frequency of exacerbations and the duration of hospitalizations, which in turn reduces the economic burden of the disease.

References

1. Abdurasulovna, H. N., Akramovna, I. K., Rustamovna, A. K., & Egamkulovich, X. B. (2023). INFLAMMATORY ACTIVITY AND RENAL PATHOLOGY IN LUPUS NEPHRITIS. *Spectrum Journal of Innovation, Reforms and Development*, *13*, 89-94.

2. Akramovna, I. K., & Rustamovna, A. K. (2023, November). ULTRATOVUSH TEKHIRUV USULINING ERTA RIVOZHLANGAN OSTEOARTHROSIS KASALLIGIDAGI DIAGNOSTIC AHAMIYATI. In *International Conference on Medicine and Life Sciences* (pp. 72-75).

3. Alisherovna, K. M. (2022). PSYCHOSOMATIC CHARACTERISTICS OF PATIENTS WITH RHEUMATOID ARTHRITIS AND GOUT. *Galaxy International Interdisciplinary Research Journal*, *10*(5), 665-671.

4. Alisherovna, K. M., & Xamroyevna, O. S. (2023). STUDY THE INFLUENCE OF CARDIOVASCULAR SYSTEM PATHOLOGY TO THE QUALITY OF LIFE. *Journal of new century innovations*, *36*(1), 148-155.

5. Alisherovna, K. M., Akramovna, I. K., Bakhtiyorovich, U. J., Nizamitdinovich, K. S., Jasurovna, J. S., Kairatovna, R. A., & Abdukholikovna, E. S. (2023). Exacerbations of chronic

obstructive pulmonary disease and coronary atherosclerosis. *Journal of new century innovations*, *39*(1), 176-178.

6. Alisherovna, K. M., Alisherovich, B. Z., Ilyosxonovich, K. I., & Oybekovna, E. E. (2022). Changes In Hemodynamics Of The Cardiovascular System In Patients With Fibrosis Alveolitis. *Spectrum Journal of Innovation, Reforms and Development*, *4*, 203-209.

7. Alisherovna, K. M., Baxtiyorovich, Z. M., & Anvarovich, N. J. (2022). To Assess The Condition Of The Myocardium In Patients Chronic Heart Failure On The Background Of Rheumatoid Arthritis. *Spectrum Journal of Innovation, Reforms and Development*, *4*, 210-215.

8. Islamova, K. A. (2022, November). Semizlik bor bemorlarda osteoartroz kasalligining klinik xususiyatlari. In *international conferences* (Vol. 1, No. 10, pp. 299-301).

9. Islamova, K. A., Olimdjanova, F. J. Q., Ziyadullaev, S. K., & Kamalov, Z. S. (2022). RISK FACTORS FOR EARLY DEVELOPMENT OF OSTEOARTHROSIS.

10. Khabibovna, Y. S., Alisherovna, K. M., Nizamitdinovich, K. S., & Totlibayevich, Y. S. (2023). FEATURES OF HEART FAILURE IN PATIENTS WITH THYROTOXICOSIS. *Journal of new century innovations*, *29*(1), 89-97.

11. Khusainova, M. A. (2023). CYSTATIN C IS AN EARLY MARKER OF DECREASED KIDNEY FUNCTION. *Oriental renaissance: Innovative, educational, natural and social sciences*, *3*(1), 485-490.

12. Khusainova, M. A. (2023). CYSTATIN C IS AN EARLY MARKER OF DECREASED KIDNEY FUNCTION. *Oriental renaissance: Innovative, educational, natural and social sciences*, *3*(1), 485-490.

13. Khusainova, M. A., Ergashova, M. M., Eshmamatova, F. B., & Khayitov, S. M. (2023). Features of quality of life indicators in patients with pneumonia. *Science and Education*, *4*(2), 138-144.

14. Khusainova, M. A., Vakhidov, J. J., Khayitov, S. M., & Mamadiyorova, M. M. (2023). Cardiac arrhythmias in patients with rheumatoid arthritis. *Science and Education*, *4*(2), 130-137.

15. O'G'Li, F. J. Z., & Akramovna, I. K. (2022). Qandli diabet kasalligi fonida yurak qon tomir tizimi kasalliklarining klinik kechuv xususiyatlari. *Talqin va tadqiqotlar ilmiy-uslubiy jurnali*, *1*(1), 108-111.

16. O'G'Li, F. J. Z., & Akramovna, I. K. (2022). Qandli diabet kasalligi fonida yurak qon tomir tizimi kasalliklarining klinik kechuv xususiyatlari. *Talqin va tadqiqotlar ilmiy-uslubiy jurnali*, *1*(1), 108-111.

17. Totlibayevich, Y. S., Alisherovna, K. M., Rustamovich, T. D., & Xudoyberdiyevich, G. X. (2023). Quality of Life in the Pathology of the Cardiovascular System. *Miasto Przyszłości*, *33*, 222-228.

18. Totlibayevich, Y. S., Alisherovna, K. M., Xudoyberdiyevich, G. X., & Toshtemirovna, E. M. M. (2022). Risk Factors for Kidney Damage in Rheumatoid Arthritis. *Texas Journal of Medical Science*, *13*, 79-84.

19. Yarmatov, S. T. (2021). Yurak Ishemik Kasalligi Va Bachadon Miomasi Bo'lgan Bemorlarni Davolashda Antikougulyant Va Antitrombositar Terapiyani O'tkazish Bo'yicha Klinik Kuzatuvni Olib Borish. *Scientific progress*, *2*(3), 792-797.

20. Yarmatov, S. T., & Xusainova, M. A. (2021). BRONXIAL ASTMA MAVJUD BO'LGAN BEMORLARDA GASTROEZOFAGIAL REFLYUKS KASALLIGI DIAGNOSTIKASI VA OLIB BORISH ALGORITMI. *Scientific progress*, *2*(2), 208-213.

21. Yarmatov, S. T., & Xusainova, M. A. (2021). Yurak Ishemik Kasalligi Mavjud Bo'lgan Bemorlarda. *Scientific progress*, *2*(3), 785-791.
22. Yarmatov, S. T., & Yarmahammadov, U. K. (2022). Semizlik–Zamonaviy Tibbiyotda Dolzarb Muammo Sifatida Qolmoqda. *Scientific progress*, *3*(4), 1196-1203.
23. Yarmuxamedova, S. X., & Normatov, M. B. R. (2021). SURUNKALI GLOMERULONEFRIT BILAN OG'RIGAN BEMORLARDA MARKAZIY GEMODINAMIKA KO'RSATKICHLARINI BAHOLASH. *Scientific progress*, *2*(2), 696-699.
24. Yarmuxamedova, S. X., & Normatov, M. B. R. (2021). SURUNKALI GLOMERULONEFRIT BILAN KASALLANGAN BEMORLARDA SUTKALIK QON BOSIMINING XARAKTERISTIKASI. *Scientific progress*, *2*(2), 706-710.
25. Исламова, К. А. (2023). Факторы Риска Раннего Развития Остеоартроза. *Journal of Science in Medicine and Life*, *1*(3), 1-7.
26. Исламова, К. А., & Тоиров, Э. С. (2019). Значение факторов риска на качество жизни больных остеоартрозом. In *Актуальные вопросы современной медицинской науки и здравоохранения: сборник статей IV Международной научно-практической конференции молодых учёных и студентов, IV Всероссийского форума медицинских и фармацевтических вузов «За качественное образование»,(Екатеринбург, 10-12 апреля 2019): в 3-х т.-Екатеринбург: УГМУ, CD-ROM.*. Федеральное государственное бюджетное образовательное учреждение высшего образования «Уральский государственный медицинский университет» Министерства здравоохранения Российской Федерации.
27. Исламова, К. А., & Хамраева, Н. А. (2023). Факторы Риска И Качество Жизни Больных Остеартрозом. *Central Asian Journal of Medical and Natural Science*, *4*(6), 268-273.
28. Хусаинова, М. А. (2021). ХРОНИЧЕСКАЯ СЕРДЕЧНАЯ НЕДОСТАТОЧНОСТЬ У БОЛЬНЫХ РАННИМ РЕВМАТОИДНЫМ АРТРИТОМ. *Journal of cardiorespiratory research*, *1*(4), 67-69.
29. Хусаинова, М. А. (2022). OZONETHERAPY IN RESTORATIVE TREATMENT PATIENTS WITH CORONARY HEART DISEASE. *Журнал кардиореспираторных исследований*, *3*(4).
30. Хусинов, А. А., Исламова, К. А., & Зиядуллаев, Ш. Х. (2023). Поражение Желудочно-Кишечного Тракта У Больных Коронавирусной Инфекцией. *Central Asian Journal of Medical and Natural Science*, *4*(6), 580-585.