THE EFFECTIVENESS OF PATIENT-ORIENTED CORRECTION OF THE CAUSES OF INSUFFICIENT ADHERENCE TO TREATMENT IN PATIENTS WITH ARTERIAL HYPERTENSION WITH ACCOMPANYING DIABETES MELLITUS

Voloshyna O. B., Zubok E. A.

INTRODUCTION

The effectiveness of treatment of many diseases, in particular, arterial hypertension (AH) and diabetes mellitus (DM), depends on several factors, one of which is adherence to treatment (AT)[1].

Insufficient AT is the basis of the increased risk of cardiovascular complications in uncontrolled AH, especially in the presence of concomitant DM[2].

In addition, insufficient AT in DM leads to the progression of damage to target organs, progressive microcirculation disorder manifested by retinopathy and nephropathy, and complex micro- and macrovascular disorders in combination with diabetic distal neuropathy form a "diabetic foot" and lead not only to a deterioration in the quality of life, but also to serious disability of these patients[3].

1. Emergence of prerequisites of the problem and formulation of the problem

The main causes observed in insufficient AT are most often divided into factors related to the patient and those related to the doctor[4].

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[1] Mancia G, et al. 2023 ESH Guidelines for the management of arterial hypertension. J Hypertens. 2023; 1;41(12):1874–2071. DOI: 10.1097/HJH.0000000000003480.

[2] Wang T.J., Vasan R.S. Epidemiology of uncontrolled hypertension in the United States. *Circulation.* 2005;112:1651–1662. doi: 10.1161/CIRCULATIONAHA.104.490599.

[3] Nuha A. ElSayed, Grazia Aleppo, Vanita R. Aroda, Raveendhara R. Bannuru, Florence M. Brown, Dennis Bruemmer et al; on behalf of the American Diabetes Association, Summary of Revisions: *Standards of Care in Diabetes–2023. Diabetes Care* 1 January 2023; 46 (Supplement_1): S5–S9. https://doi.org/10.2337/dc23-Srev

[4] The unmet challenge of medication nonadherence. Kleinsinger F. *Perm J.* 2018;22:1–3.

Educational measures (instruction, explanatory work, issuing reminders-printouts, information about sites that contribute to the awareness of patients about the disease and the risks of non-compliance) are usually used to improve AT.

2. The analysis of existing methods for solving the problem and formulating a task for the optimal development

The expediency of using methods of technical influence (electronic devices with a drug that record the time and frequency of intake, the method of telephone visits with a reminder to take the drug), measures aimed at actively involving the patient in the treatment process (measurement of blood pressure (BP) in home conditions with keeping blood pressure and glycemia control diaries, regular visits to the doctor, keeping self-monitoring diaries with the time of taking medications, etc. are currently emphasized[5].

It has been established that additional methods of insufficient blood pressure correction can significantly improve the effectiveness of treatment and the quality of life of patients with pseudoresistant AH[6].

Considering this, it is important not only to identify patients with poor adherence to treatment (AT), but also to apply additional methods to improve the compliance of patients with this comorbid pathology.

Aim. The aim of study was to investigate the causes of insufficient adherence to treatment in patients with AH with concomitant DM and to evaluate the effectiveness of patient-oriented methods of correction of insufficient adherence to treatment in terms of their impact on achieving target blood pressure and glycemia, improving the quality of life of patients with this comorbid pathology.

Material and methods. Protocol of the study was previously approved by the bioethics commission of Odesa National Medical University, were carried out under the outpatient conditions of the polyclinic department of the Center for Reconstructive and Restorative Medicine (University Clinic) of Odesa National Medical University. Patients were included in the study based on the inclusion criteria and absence of exclusion criteria.

The study included 120 patients with a stable course of stage II hypertension of 1–2 degrees with concomitant compensated DM type 2 with a level of glycated hemoglobin (HbA1c) that did not exceed 9%. Duration of AH and DM were more than 1 year before patients were included in the study.

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[5] Medication adherence influencing factors-an (updated) overview of systematic reviews. Gast A, Mathes T. *Syst Rev.* 2019;8:112.

[6] Voloshyna O., Zbitnieva V., Lysyi I., Dukova O., Dychko T., Chaika A., Balashova I., Naydynova O. The role of the psychological type of personality in the formation of adherence to treatment of patients with resistant arterial hypertension. Journal of Education, Health and Sport. 2020;10(2):196-. eISSN 2391-8306. DOI http://dx.doi.org/10.12775/JEHS.2020.10.02.024

After carrying out primary diagnostic procedures, which are recommended by current international Gidelines[7,8] due to the criteria for inclusion and the absence of exclusion criteria for the study were determined in all the patients.

Inclusion criteria

1. Men and women aged 45–74.

2. Diagnosis of essential hypertension with accompanying DM. The duration of hypertension and diabetes mellitus is at least one year before inclusion in the study.

3. Signed informed consent for participate in the study.

Exclusion criteria

1. AH III degree (patients who have suffered a myocardial infarction, stroke less than 6 months ago).

2. Presence of heart failure with a reduced ejection fraction, III–IV functional classes.

3. Presence of severe diabetes with HbA1c greater than 9%.

4. Presence of active chronic viral hepatitis with the level of ALT and AST more than three times higher than the upper limit of normal.

5. Presence of chronic renal failure above the 3rd degree (with a glomerular filtration rate of less than 30 ml/min/m^2).

6. History of severe allergy or intolerance to medications.

7. Known disorders of the blood coagulation system.

8. Associated oncological pathology.

9. Coronary artery bypass grafting or percutaneous coronary intervention < 6 months ago, surgical interventions < 6 months ago.

10. Chronic concomitant diseases in the stage of decompensation.

11. Acute infectious diseases.

12. Inflammatory diseases of the heart: infectious endocarditis, myocarditis, pericarditis.

13. Heart defects that require surgical treatment or prosthetic valves, presence of an artificial pacemaker.

14. For women of childbearing age – pregnancy or breastfeeding.

15. Status of patients with an expected life expectancy less than 1 year.

All the patients underwent a comprehensive clinical examination, which took into account their complaints (their expressiveness and duration, the connection of increased symptoms with physical exertion, stressful effects, diet disorders); analysis of anamnesis data was carried out (duration of hypertension and diabetes mellitus, frequency of exacerbations, family

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[7] European Society of Cardiology. (2018). 2018 ESC/ESH ClinicalPractice Guidelines for the Management of Arterial Hypertension.https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/Arterial

[8] Hypertension-Management-of International Society of Hypertension. Hypertension (2020). 2020 Clinical Practice Guidelines. Medscape, May 29. https://reference.medscape.com/viewarticle/931364

anamnesis, etc.); information about other concomitant diseases, in particular, Covid-19 was collected. Special attention was paid to the evaluation of the effectiveness of basic therapy drugs for hypertension and DM, presence of allergies or intolerance to the drugs that the patients used, as well as the patients' adherence to treatment in general.

Personal reasons for poor adherence to treatment (AT) were identified in all patients using Morisky-Green questionnaire[9]. Adherence to treatment based on the total number was divided into three levels of adherence: 0 to <6 (low); from 6 to <8 (average); 8 or more – high.

In addition, a modified questionnaire of adherence to treatment in patients with type 2 diabetes mellitus (SDSCA)[10] was used.

After identifying the causes of poor adherence to treatment, all patients were counseled on the need to follow all recommendations related to their treatment. During the survey, it was determined which causes could be overcome as soon as possible and help in the form of telephone consultations and reminders about treatment was offered.

In all patients, the risk of the probability of cardiovascular complications during 10 years was calculated according to the SCORE2 scale, in which the risk calculation takes into account peculiarities patients with diabetes mellitus[11].

Indicators of patients' quality of life were assessed using the validated EQ-5D questionnaire developed by the European Quality of Life Research Group[12]. The questionnaire consists of two parts. The first includes five sections related to mobility, self-care ability, activities of daily living, pain/discomfort, and anxiety/depression. Each section has five answer options according to the degree of expressiveness. The second part is represented by an integral indicator in the form of a visual analog scale (VAS) from 0 to 100, on which the patient notes the general state of his health at the time of the survey. The questionnaire was filled out by the patient himself.

Antihypertensive and antidiabetic treatment was adjusted for all the patients.

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[9] Morisky D. E., Green L. W., Levine D. M., 1986)[Morisky, D. E., Green, L. W., Levine, D. M. Concurrent and predictive validity of a self-reported measure of medication adherence [Text] / Morisky D.E., Green L.W., Levine D.M. // J Med Care. – 1986. – №24(1). P. 67–74.

[10] Toobert DJ, Glasgow RE. In: *Handbook of psychology and diabetes: a guide to psychological measurement in diabetes research and practice.* Bradley C, editor. Reading: Harwood Academic Publishers; 1994. Assessing diabetes self-management: the summary of diabetes self-care activities questionnaire; pp. 351–375.

[11] SCORE2-OP working group and ESC Cardiovascular risk collaboration , SCORE2-OP risk prediction algorithms: estimating incident cardiovascular event risk in older persons in four geographical risk regions, *European Heart Journal*, Volume 42, Issue 25, 1 July 2021, Pages 2455–2467, https://doi.org/10.1093/eurheartj/ehab312

[12] EQ-5D. The EuroQol Group. EuroQol–a new facility for the measurement of health-related quality of life. Health Policy. 1990;36:199–208.EuroQol Research Foundation. Retrieved 22 February 2016

At the first visit, all the patients received usual methods of correction of insufficient AT, which included the doctor's explanatory work, which included providing recommendations on lifestyle modification, smoking cessation, dietary recommendations, introduction of home blood pressure monitoring and glycemic control with diaries into the practice of patients' self-monitoring, insisting on adherence to treatment, issuing reminders for patients with information about the disease and websites with recommendations for lifestyle correction. After that, the patients were randomly assigned to the control group (60 people), in which generally accepted methods of correction of insufficient AT were applied, and to the main group (60 patients), to whom individual methods of correction of insufficient AT were applied.

Such individual, patient-oriented methods of insufficient AT correction as SMS or phone calls were used with a reminder to take medications as well as a survey about the blood pressure level and glucose, individual recommendations for compliance with all the requirements of the standard method of blood pressure measurement, recommendations for individual medication intake depending on the blood pressure level during the day, etc. All patients who did not have their own glucometers and tonometers were invited to come to the medical facility weekly to check blood pressure and glucose levels during the first month of observation, then every 2 weeks.

All the patients were invited to the second visit to the doctor 3 weeks after the first visit and the administration of treatment, and to the third – after 3 months of treatment. At these visits, in addition to a general clinical examination, laboratory indicators were examined, an electrocardiogram was performed, the risk of complications was calculated according to SCORE2, and adherence to treatment was assessed. If necessary, the doctor adjusted the treatment of AH and/or DM. At all visits, recommendations were also provided to improve the AT.

Statistical processing of the received data was carried out using Microsoft Excel 2013 (Microsoft Corporation, USA, 2013) and Statistica 6.0 (StatSoft, version 13.3.721) computer programs. The normality of the distribution of quantitative traits was assessed using the Shapiro–Wilk test. The Indicators are given as a mean value and standard error of the mean value (M ± m). The probability of the difference in indicators was calculated using the $\chi 2$ test and Student's t-test with normal distribution

of values. The results of comparisons under conditions of $p < 0.05$ were considered reliable[13].

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[13] Antomonov M.Yu. Mathematical processing and analysis of medical and biological data. 2nd edition. K.: Medinform, 2018. 579 p.

Results

The analysis showed that according to the main indicators of clinical characteristics, age and gender, the patients of both groups were comparable (Table 1).

Table 1

Characteristics of patients with arterial hypertension with accompanying diabetes mellitus who were included in the study

Indicator	Group I (control) (n=60)	Group II (main) (n=60)	P
Age, years, M ± m	56,8 ± 0,83	58,7 ± 0,9	>0,5
Men, n, %	28 (46,7%)	31 (51,7%)	0,52
Women, n,%	32 (53,3%)	29 (48,3%)	0,57
SBP level, mm Hg	159,8 ± 3,2	153,8 ± 3,7	>0,3
DBP level, mm Hg	83,3 ± 2,8	86,7 ± 4,1	>0,5
Fasting glucose level, mol/L, M ± m	9,2 ± 1,1	8,7 ± 0,9	>0,5

Notes: 1. data of quantitative indicators are presented as (M ± m) – mean value ± mathematical error of the mean. 2. comparison of percentages between groups was carried out according to the χ2 criterion. 3. the difference was considered reliable at p < 0.05. 4. BP – blood pressure. 5. SBP – systolic blood pressure. 6. DBP – diastolic blood pressure.

The table shows that the average age and gender of the patients of both groups did not differ significantly. In terms of SBP, DBP, and glycemia, the groups also did not differ significantly.

The analysis of the 10-year risk of cardiovascular complications showed that 58 (96.7%) patients of the first group and 57 (95.5%) patients of the second group had a high or very high risk according to the SCORE2 scale.

The basic therapy of hypertension, according to current guidelines[7-8], included the use of an inhibitor of angiotensin-converting enzyme (IACE) or an angiotensin receptor blocker (ARB) in combination with a calcium channel blocker amlodipine or hydrochlorothiazide. The proportion of patients who received double antihypertensive combinations of IACE in combination with hydrochlorothiazide or amlodipine in the main group was 35.0%, in the control group – 33.3% (P>0.5), ARB in combination with hydrochlorothiazide or amlodipine in the main group was 45.0%, in the control group – 41.7% (P>0.5). The triple antihypertensive combination (ACEI or ARB in combination with hydrochlorothiazide and amlodipine) was 20.0% in the main group, 25.0% in the control group (P>0.5).

Metformin in combination with sulfonylurea (glimepiride or gliclazide MR) was included in the basic therapy of DM 2 in most patients (83.3% in the main and 80.0% in the control group (P>0.5)). The triple combination of antidiabetic drugs, which included metformin in combination with sulfonylurea with the addition of dapagliflozin or empagliflozin, was received by 11.7% of patients in the main group and 13.3% in the control group (P>0.5)). Only 3 (0.5%) patients of the main group and 4 (0.7%) patients of

the control group received metformin monotherapy (P>0.5). It shows^ that in the main group and the comparison group, the composition of basic therapy for hypertension and diabetes was almost similar. 14 (23.3%) patients of the control group and 16 (26.7%) of the main group additionally received sulodexide capsules of 250 LO twice a day. All patients were also prescribed statin therapy with atorvastatin or rosuvastatin in medium therapeutic doses.

Our analysis of the reasons for low adherence to treatment allowed us to distinguish two groups of reasons: subjective (related to the patient) and objective (related to the prescribed treatment). Among the reasons for violation of adherence to treatment in patients with hypertension and diabetes mellitus, subjective reasons related to the patient prevailed – 80.1%, the remaining 19.9% – objective reasons related to the prescribed treatment.

As the study showed, among the reasons for insufficient blood pressure control related to the doctor, almost a third had insufficient doses of antihypertensive drugs (respectively, in 17 (28.3%) patients of the first group and 19 (31.7%) of the second group). The analysis of the objective causes of insufficient blood pressure showed that the vast majority of patients, both in the control group (76.7%) and in the main group (73.3%), consulted a family doctor only in case of a significant increase in blood pressure, that is, a hypertensive crisis, and not for planned correction of basic therapy. Only a small number of patients (8 patients (13.3%) of the first group and 11 (18.3%) of the second group) visited their family doctor 4-6 times a year to get prescriptions under the Affordable Medicines program. Among the main subjective reasons for patients' lack of adherence to antihypertensive treatment were irregular use of drugs 69 (71.2%), side effects 5 (5.2%), high cost of drugs 14 (14.4%), insufficient awareness of patients about the need to control blood pressure 9 (9.2%).

On average, the frequency of visits to the family doctor was (2.7±0.3) times per year in the control group and (2.3±0.2) times per year in the main group (p>0.5).

Conversely, patients with hypertension with concomitant type 2 diabetes mellitus visited an endocrinologist much more often – on average (7.5±0.3) times per year in the control group and (6.9±0.3) times per year in the main group (p>0.5).

When analyzing the modified questionnaire of adherence to treatment in patients with type 2 diabetes (SDSCA), it was found that only 49 (40.8%) of the examined patients with hypertension with concomitant type 2 diabetes followed the dietary recommendations well. The majority of patients – 71 (59.2%) showed insufficient adherence to dietary recommendations. Only a third of patients followed the recommendations for physical activity, 47 (30.8%) patients, and the majority – 83 (69.2%) patients did not engage in prescribed physical activity. Glycemic control (6–7 times a week) was carried out in 33 (27.5%) patients, 36 (30.0%) patients monitored their blood glucose level 4–5 times a week. 12 (18.5%) patients carried out prevention of diabetic foot 5–7 times a week, 28 (43.1%) patients carried out a preventive

examination of their feet 4–5 times a week, the rest – 25 (38.4%) patients – only 0–3 times a week. 115 (95.8%) patients took hypoglycemic drugs regularly (7 times a week), 5 (4.2%) patients – only 5 or 6 times a week, which was explained by forgetting to take the drug for various reasons.

As it turned out, among the main reasons for irregular intake of antihypertensive drugs, a third of patients (23–33.3%) did not consider it necessary to take drugs due to the fact that they do not feel the deterioration of the condition associated with an increase in blood pressure. 19 (27.5%) patients preferred herbal preparations rather than the means prescribed by the doctor for the treatment of both hypertension and diabetes. About a quarter of patients (16–23.2%) answered that they often forget to take pills if they have to be taken several times a day. 11 (15.9%) patients noted that they cannot always take pills regularly due to the specifics of their work.

In general, low adherence to treatment according to the Morisky Green questionnaire in the control group was found in 28 (46.7%) patients, average – in 21 (35.0%), and high adherence – only in 11 (18.3%) people, and in the main group – in 29 (48.3%), 23 (38.3%) and 8 (13.3%) patients, respectively.

The study showed that patient-oriented methods of correction of insufficient AT in patients with hypertension with concomitant diabetes mellitus made it possible to improve the compliance of these patients and achieve the target level of blood pressure and fasting glucose in most patients already in the 3rd week (tab. 2).

Table 2

The frequency of achieving the target level of blood pressure and glycemia in patients with arterial hypertension with accompanying diabetes mellitus due to various methods of correction of adherence to treatment after 3 weeks of treatment

Indicator	Group I (control) (n=60)	Group II (main) (n=60)	P
Target BP level, n, %	11 (18,3%)	25 (41,7%)	<0,05
The need for AHT correction, n, %	18 (30,0%)	19 (31,7%)	>0,05
The need for correction of AT AH, n, %	31(51,7%)	16 (26,7%)	<0,05
Fasting glucose target, n, %	19 (31,7%)	28(46,7%)	>0,05
The need for correction of HGT, n, %	17 (28,3%)	18 (30,0%)	>0,05
The need for correction of AT DM, n, %	24 (40,0%)	14(23,3%)	<0,05

Notes. This table and table 3 indicate: 1. The data of quantitative indicators are presented as (M ± m) – mean value ± mathematical error of the mean. 2. Comparison of percentages between groups was carried out according to the χ2 criterion, the difference was considered reliable at p < 0.05. 3. AH – arterial hypertension. 4. BP – blood pressure. 5. AHT – antihypertensive therapy. 6. AT – adherence to treatment. 7. AT AH – adherence to the treatment of arterial hypertension. 8. DM – diabetes mellitus. 9. AT DM – adherence to the treatment of diabetes. 10. HGT – hypoglycemic therapy.

Table 2 shows that after 3 weeks in the main group, in which patient-oriented methods of BP improvement were implemented, almost half of the patients (41.7%) achieved the target blood pressure level (less than 130/80 mm Hg). In the control group, only 18.3% (P<0.05) achieved the target blood pressure level. At the same time, a third of patients in both groups needed AHT correction by a doctor, and almost twice as many patients in the control group (51.7%±6.5%) needed correction of AT in patients than in the main group (26.7±5.7%), (P<0.05). Analysis of the effectiveness of hypoglycemic therapy showed that after 3 weeks of treatment, the target fasting glucose level (less than 7.0 mmol/l) in the main group was achieved in almost significantly more patients compared to the control group (respectively, 46.7±6.4% against 31.7±6.0%, >0.05). At the same time, almost twice as many patients in the control group than in the main group needed further correction of adherence to treatment (P<0.05).

A more detailed analysis showed that in the main group, in which patient-oriented methods of correction of adherence to treatment were carried out, after three weeks the proportion of patients with insufficient AT significantly decreased from 48.3±6.5% to 26.7±5.7% (P<0.05), and in the control group these changes were unreliable (Table 3).

Table 3

Changes in adherence to treatment depending on the methods of its correction in patients with arterial hypertension with accompanying diabetes mellitus after 3 weeks of treatment (n, %)

Adherence to treatment	Group I (control) (n=60)			Group II (maain) (n=60)		
	Visit I	Visit II	P	Visit I	Visit II	P
Low	28 (46,7%)	19 (31,6%)	>0,05	29 (48,3%)	10 (16,7%)	<0,05
Average	21 (35,0%)	26 (43,3%)	>0,05	23(38,3%)	28 (46,7%)	>0,05
High	11 (18,3%)	15 (25,0%)	>0,05	8(13,3%)	22 (36,7%)	<0,05

Table 3 shows that low adherence to treatment at the first visit in the control group was found in 28 (46.7%) patients, average in 21 (35.0%) and high adherence in only 11 (18.3%) people, in the main group, the proportions of patients were comparable, in 29 (48.3%), 23 (38.3%) and 8 (13.3%) patients, respectively. At the second visit, after 3 weeks, the number of patients with high adherence to treatment significantly increased in the main group (from 13.3±4.4% to 36.7±6.2%, P<0.05) and the proportion of patients with very low adherence to treatment decreased (from 29 (48.3%) to 10 (16.7%), P<0.05), and in the control group, 3 weeks after the 1st visit, high adherence to treatment was observed only in a quarter (25.0%) of patients, and the number of patients with low adherence to treatment changed unreliably (from 28 (46.7%) to 19 (31.6%), P>0.05).

At the third visit, after 3 months of treatment, in the group in which patient-oriented methods of correction of insufficient AT were implemented, the percentage of patients with high AT, as well as the proportion of patients who reached the target level of blood pressure and glycemia, were significantly higher compared to the control group (tab. 4).

The frequency of reaching the target level of blood pressure and glycemia in patients with arterial hypertension with accompanying diabetes mellitus after 3 months

Indicator	Group I (control) (n=60)	Group II (main) (n=60)	P
Target BP level, n, %	21 (35,0%)	47 (78,3%)	<0,001
The need for AHT correction, n, %	17(28,3%)	9 (15,0%)	>0,05
The need for correction of AT AH, n, %	22 (36,7%)	4 (6,7%)	<0,001
Fasting glucose target, n, %	19 (31,7%)	34 (56,7%)	<0,01
The need for correction of HGT, n, %	12 (20,0%)	17 (28,3%)	>0,05
The need for correction of AT DM, n, %	32 (53,3%)	9 (15,0%)	<0,001

Notes. 1. The data of quantitative indicators are presented as (M ± m) – mean value ± mathematical error of the mean. 2. Comparison of percentages between groups was carried out according to the χ2 criterion, the difference was considered reliable at p < 0.05.
3. AH – arterial hypertension. 4. BP – blood pressure. 5. AHT – antihypertensive therapy.
6. AT – adherence to treatment. 7. AT AH – adherence to the treatment of arterial hypertension.
8. DM – diabetes mellitus. 9. AT DM – adherence to the treatment of diabetes. 10. HGT – hypoglycemic therapy.

Table 4 shows that after 3 months in the main group, in which patient-oriented methods of improving blood pressure were carried out, the majority of patients (78.3±5.3%) achieved the target blood pressure level, and in the control group, a significantly smaller percentage (35.0±6.2%). The dynamics of achieving the target fasting glucose level was similar (respectively, 56.7±6.4% of patients in the main group versus 31.7±6.0% in the control group, P<0.05). At the same time, AHT correction was needed for almost a third of patients in the control group (36.7±6.5%), and significantly fewer patients in the main group (6.7±3.2%, P<0.001). Correction of adherence to antidiabetic treatment was also required for significantly more patients in the control group than in the main group (respectively, 53.3±6.4% vs. 15.0±4.6%, P<0.001).

In general, in the control group, the number of patients with high AT changed unreliably (tab. 5).

Table 5

Changes in adherence to treatment depending on the methods of its correction in patients with arterial hypertension with accompanying diabetes after 3 months of treatment (n, %)

Adherence to treatment	Group I (control) (n=60)			Group II (main) (n=60)		
	Visit II	Visit III	P	Visit II	Visit III	P
Low	19 (31,6%)	13 (21,7%)	>0,05	10 (16,7%)	4 (6,7%)	<0,05
Average	26 (43,3%)	28 (46,7%)	>0,05	28 (46,7%)	9 (15,0%)	<0,01
High	15 (25,0%)	19 (28,3%)	>0,05	22 (36,7%)	47 (78,3%)	<0,001

The data given in tab. 5, show that at the third visit, after 3 months, the number of patients with high adherence to treatment almost doubled in the main group (from 36.7±6.2% to 78.3±5.3%, P<0.001) and the proportion of patients with low and medium adherence to treatment decreased (from 63.3±6.2%) to 21.7±5.3%, P<0.001), and in the control group there was no significant increase in the percentage of patients with high adherence to treatment.

Against the background of improved blood pressure and glycemic control in patients with hypertension with type 2 diabetes mellitus, well-being, household and social activity improved, which was reflected in positive changes in the integral and quality of life indicators: in the main group, it increased significantly – from 48.7±2.2 to 69.4±3.3 (p<0.01), and in the control group the increase of this indicator was unreliable – from 49.0±2.8 to 57.9±3.8 (p>0.1).

Therefore, if in patients with a combined pathology – hypertension with accompanying diabetes mellitus, with hypertension and/or antidiabetic treatment, it is not possible to achieve the target level of blood pressure and glycemia, it is recommended to evaluate AT and, if necessary, correct it, taking into account the main reasons for insufficient AT in each patient.

CONCLUSIONS

1. Insufficient adherence to treatment in patients with hypertension with accompanying diabetes mellitus in almost a third of patients may be the reason for not achieving the target blood pressure and glycemia in these diseases.

2. Patient-oriented methods correction of adherence to treatment allow not only to improve compliance, but also to improve indicators of the diseases and quality of life of patients with this comorbid pathology.

SUMMARY

The effectiveness of treatment of many diseases, in particular, arterial hypertension (AH) and diabetes mellitus (DM), depends on several factors, one of which is adherence to treatment (AT).

Considering this, it is important not only to identify patients with poor adherence to treatment, but also to apply additional methods to improve the compliance of patients with this comorbid pathology.

The aim of study was to investigate the causes of insufficient adherence to treatment in patients with AH with concomitant DM and to evaluate the effectiveness of patient-oriented methods of correction of insufficient adherence to treatment in terms of their impact on achieving target blood pressure and glycemia, improving the quality of life of patients with this comorbid pathology.

Material and methods. The study included 120 patients with a stable course of stage II hypertension of 1–2 degrees with concomitant compensated diabetes mellitus type 2 with a duration of these diseases for more than 1 year.

Personal reasons for poor adherence to treatment (AT) were identified in all patients using the Morisky-Green questionnaire. Adherence to treatment based on the total number was divided into three levels of adherence: 0 to <6 (low); from 6 to <8 (average); 8 or more – high.

Among the reasons for violation of adherence to treatment in patients with hypertension and diabetes mellitus, subjective reasons related to the patient prevailed – 80.1%, the remaining 19.9% – objective reasons related to the prescribed treatment.

After already 3 weeks in the main group, in which patient-oriented methods of AT improvement were implemented, almost half of the patients (41.7%) achieved the target blood pressure level, that is, less than 130/80 mm Hg. In the control group, only 18.3% (P<0.05) achieved the target blood pressure level. At the same time, a third of patients in both groups needed AHT correction by a doctor, and almost twice as many patients in the control group (51.7%±6.5%) needed correction of AT than in the main group (26.7±5.7%), (P<0.05). Analysis of the effectiveness of hypoglycemic therapy showed that after 3 weeks of treatment, the target fasting glucose level (less than 7.0 mmol/l) in the main group was achieved in significantly more patients compared to the control group (respectively, 46.7±6.4% against 31.7±6.0%, >0.05). At the same time, almost twice as many patients in the control group than in the main group needed further correction of adherence to treatment (P<0.05).

After 3 months, in the main group, in which patient-oriented methods of AT improvement were implemented, the majority of patients (78.3±5.3%) achieved the target BP level, whereas in the control group, a significantly lower percentage (35.0±6.2%) achieved it. The dynamics of achieving the target fasting glucose level were similar (respectively, 56.7±6.4% of patients in the main group versus 31.7±6.0% in the control group, P<0.05). At the same time, AHT correction was needed for almost a third of patients in the control

group (36.7±6.5%), and significantly fewer patients in the main group (6.7±3.2%, P<0.001). Correction of adherence to antidiabetic treatment was also required for significantly more patients in the control group than in the main group (respectively, 53.3±6.4% vs. 15.0±4.6%, P<0.001).

Therefore, if in patients with a combined pathology – hypertension with accompanying diabetes mellitus, with hypertension and/or antidiabetic treatment, it is not possible to achieve the target level of blood pressure and glycemia, it is recommended to evaluate AT and, if necessary, correct it, taking into account the main reasons for insufficient AT in each patient.

Conclusions. 1. Insufficient adherence to treatment in patients with hypertension with accompanying diabetes mellitus in almost a third of patients may be the reason for not achieving the target blood pressure and glycemia in these diseases. 2. Patient-oriented methods correction of adherence to treatment allow not only to improve compliance, but also to improve indicators of the diseases and quality of life of patients with this comorbid pathology.

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Information about the authors:
Voloshyna Olena Borysivna,
https://orcid.org/0000-0002-7685-7313
Doctor of Medical Sciences, Professor,
Head of the Department of General Practice,
Odessa National Medical University
2, Valikhovsky Lane, Odesa, 65062, Ukraine

Zubok Elanna Anatoliivna,
https://orcid.org/0009-0005-1755-5912
Postgraduate Student at the Department of General Practice,
Odessa National Medical University
2, Valikhovsky Lane, Odesa, 65062, Ukraine