

Features of Treatment of Arterial Hypertension against the Background of Diabetes Mellitus

Murodova Railya Rustamovna

Assistant of the department of clinical pharmacology, Samarkand State Medical University, Samarkand, Uzbekistan

Annotation: The problem of diabetes mellitus (DM) refers to diseases with a steady increase, with a high risk of complications and disability of patients due to the development of complications, early mortality, in many cases from cardiovascular pathology, as well as social problems [1,3,8]. Arterial hypertension in patients with diabetes mellitus has a number of features. Firstly, it occurs more often than in people without diabetes. Secondly, the course of the disease is more severe, complications develop more often. Thirdly, with a combination of these diseases, the risk of developing formidable cardiovascular complications such as myocardial infarction and stroke increases significantly. Arterial hypertension occurs in approximately 85% of patients with DM, and the presence of these two diseases aggravates the course of each of them. Therefore, the treatment of arterial hypertension in patients with diabetes mellitus should be more active. [2,7,11]. It is recommended to maintain blood pressure levels in the presence of damage to target organs such as the kidneys, heart, and eyes below. Recent clinical studies and analyses have demonstrated the priority of combined antihypertensive therapy, which increases the effectiveness of targeted correction of blood pressure and prevention of long-term complications in patients with type 2 diabetes [3,5,10]. Therapy for arterial hypertension in patients with diabetes should include not only drug therapy, but also lifestyle changes: quitting smoking, limiting alcohol consumption, losing weight, and increasing physical activity. In this article, we try to draw attention to the features of the course of hypertension in patients with diabetes, the difference in the mechanisms of these diseases, and analyze modern principles of treatment and therapeutic features of such patients. This is a very important point, which emphasizes the need for an integrated approach to treatment. Pathological mechanisms affecting the patient's health should be considered in their relationship and interaction. Only such an approach will achieve the best results in correcting the patient's condition. Truly innovative treatment methods aimed at correcting pathological mechanisms can have a positive effect not only on blood sugar levels, but also on blood pressure. This opens up new opportunities for comprehensive health management of patients with type 2 diabetes and reducing the risk of complications.

Keywords: arterial hypertension, diabetes mellitus, cardiovascular complications, antihypertensive drugs.

Materials and methods: To achieve the objective, we examined 84 patients with hypertension: 48 patients (28 women, 58.3% and 20 men, 41.7%) with comorbid course of hypertension and type 2 diabetes mellitus (main group), 36 patients (22 women, 61.1% and 14 men, 38.9-30%) with hypertension without diabetes mellitus (control group). The average age of all patients in the first group was 55.1 ± 4.7 years, duration of hypertension – 5.0 ± 0.6 years, type 2 diabetes mellitus – 3.8 ± 0.4 years, the average age of patients in the control group was 65.7 ± 4.8 years, duration of hypertension – 4.0 ± 0.7 years.

Results: As a result of the study, among patients of the main group (with comorbid course of hypertension and type 2 diabetes mellitus), 12 (25%) patients were diagnosed with normal body weight (according to the Quetelet index), 16 (33.3%) - overweight, 14 (29.1%) - grade I obesity, 12 (25%) - grade II obesity and 6 (12.5%) - grade III obesity. If in the control group, body weight was within normal values in 16 (44.4%) patients, then overweight was detected in 20 (55.5%) patients, grade I obesity in 12 (75.0%), and grade III obesity in 4 (25.0%). In the main group, stage I

hypertension was present in 16 (33.3%) patients, stage II hypertension – in 22 (45.8%), stage III hypertension – in 10 (20.8%); in the control group: stage I hypertension – in 18 (50.0%) patients, stage II hypertension – in 12 (33.3%), stage III hypertension – in 6 (16.7%). In patients of the main group, the average cholesterol content was 9.7 ± 0.8 mmol/l, which was significantly higher than in patients of the control group (5.2 ± 0.6 mmol/l, $P < 0.02$). The degree of increase in blood cholesterol had a direct correlation with the duration of hypertension ($r = 0.68$) and type 2 diabetes ($r = 0.74$).

Among all patients with hypertension, concomitant diseases were detected in 40 patients, which is 47.63%: in 28 (53.3%) patients of the main group, in 12 (33.3%) patients of the control group. The most frequent concomitant diseases among patients of the main group were - cerebrovascular insufficiency (in 20 patients, 41.1%), ischemic heart disease (in 17 patients, 35.4%), other endocrine pathology: diffuse goiter (in 6 patients, 12.5%). According to our data, the frequency of hypertensive cerebrovascular disease and ischemic heart disease in patients of the control group was lower (6 and 15%). Rhythm and conduction disturbances were found in 16 (33.3%), signs of retinopathy in 22 (45.3%), signs of chronic heart failure in 10 (20.1%) patients of the main group and, respectively, in 12 (33.3%), 8 (22.2%) and 4 (10%) patients of the control group. Frequent nosebleeds were reported by 8 (16.6%) patients, 4 patients (11.1%) of the second group.

Discussion of the results. The combination of type 2 diabetes and hypertension significantly increases the likelihood of the development of end-stage microvascular diabetic complications (chronic renal failure, blindness, lower limb amputation), myocardial infarction, stroke, and worsens the prognosis and quality of life of patients. Thus, in type 2 diabetes without hypertension, the risk of developing coronary heart disease (CHD) and stroke is 2-3 times higher than in the general population, the risk of chronic renal failure increases by 15-20 times, complete loss of vision by 10-20 times, gangrene - by 20 times. [6,7].

Concomitant hypertension increases the risk of complications by at least another 2-3 times, even with satisfactory control of metabolic parameters [8,11].

Numerous data confirm that BP control in patients with diabetes is crucial for improving long-term prognosis. Even the advent of new antidiabetic drugs with proven cardio- and nephroprotective effects does not diminish the importance of this observation [3]. The first evidence of this fact was obtained in the UKPDS study, which compared patients with type 2 diabetes with more and less intensive antihypertensive therapy (AHT) strategies. The BP level in the more intensive control group was 144/82 mm Hg versus 154/87 mm Hg in the comparison group ($p = 0.0001$), the difference in systolic BP (SBP) and diastolic BP (DBP) was 10 mm Hg and 5 mm Hg, respectively. However, the intensive AHT strategy immediately demonstrated convincing advantages in reducing all complications associated with diabetes by 24%, deaths from diabetes by 32%, and strokes by 44% (all differences are statistically significant) [3,8,9]. These results were continued in the NOT study, which showed that achieving a diastolic blood pressure of 80 mm Hg in patients with diabetes leads to a 23-fold decrease in the risk of cardiovascular complications (CVC) and mortality [4,10,13]. Thus, the risk of CVC in patients with diabetes directly depends on the dynamics of blood pressure and becomes minimal when its target level is reached.

Conclusion. In summary, hypertension is a significant and controllable risk factor for macrovascular and microvascular complications in diabetes. Numerous clinical studies have confirmed the effectiveness of hypertension correction using several classes of antihypertensive drugs to prevent cardiovascular and microvascular complications. In addition, in addition to lifestyle changes, achieving target blood pressure often requires the use of several classes of antihypertensive drugs. Angiotensin-converting enzyme inhibitors, sartans, dihydropyridine calcium channel blockers, and thiazide-like diuretics have been shown to improve clinical outcomes and are preferred for blood pressure control in patients with diabetes.

Angiotensin receptor blockers or angiotensin-converting enzyme inhibitors are recommended as the main drugs for patients with arterial hypertension and type 2 diabetes mellitus, in the absence of contraindications, especially in the presence of proteinuria or microalbuminuria, since they have the

greatest renoprotective effect. The development of diabetic nephropathy is accompanied by an extremely high risk of cardiovascular complications, so strict metabolic and hemodynamic control, lowering blood pressure and reducing proteinuria to the lowest possible values are necessary. In addition, these classes of drugs can improve or at least not worsen the sensitivity of peripheral tissues to insulin.

Thus, therapy should be adapted to a specific patient, taking into account concomitant diseases, the expected benefit in reducing the risk of developing cardiovascular diseases associated with atherosclerosis, heart failure, progressive nephropathy and retinopathy, as well as the risk of adverse events.

Literature:

1. Advance Collaborative Group // *Diab. Med.*, 2005; 22: 1–7.
2. Cowie C.C. Diabetes Diagnosis and Control: Missed Opportunities to Improve Health : The 2018 KellyWest Award Lecture. *Diabetes Care*. 2019;42(6):994-1004. DOI:10.2337/dci18-0047.
3. Dedov I.I., Shestakova M.V. Diabetes mellitus and arterial hypertension. Moscow: MIA; 2006 [Дедов И.И., Шестакова М.В. Сахарный диабет и артериальная гипертензия. М.: МИА; 2006].
4. Diagnosis and treatment of arterial hypertension (clinical guidelines) // Order of the Ministry of Health of the Republic of Belarus dated 14.04.2006 No. 273.
5. Shodiyeva D., Shernazarov F. ANALYSIS OF THE COMPOUNDS PROVIDING ANTIHELMITIC EFFECTS OF CHICHORIUM INTYBUS THROUGH FRACTIONATION // *Science and innovation*. – 2023. – Т. 2. – №. D2. – С. 64-70.
6. Guidelines for the management of arterial hypertension. The Task Force for the management of arterial hypertension of the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH). *Eur Heart J*. 2018;39(33):3021-104. DOI:10.1093/eurheartj/ehy339
7. Hanson L., Zanchetti A., Carruthers S.3G., et al. Effects of intensive blood pressure lowering and lowdose aspirin in patients with hypertension: principal results of the Hypertension Optimal Treatment(HOT) randomised trial. *Lancet*. 1998;351:1755-62. DOI:10.1016/s0140-6736(98)04311-6.
8. Lau T., Carlsson P.O., Leung P.S. Evidence for a local angiotensin-generating system and dose-dependent inhibition of glucose-stimulated insulin release by angiotensin II in isolated pancreatic islets. *Diabetologia*. 2004;47:240-8. DOI:10.1007/s00125-003-1295-1.
9. Nowakowska M., Zghebi S.S., Ashcroft D.M., et al. The comorbidity burden of type 2 diabetes mellitus: patterns, clusters and predictions from a large English primary care cohort. *BMC Med*. 2020 Jan25;18(1):22]. *BMC Med*. 2019;17(1):145. DOI:10.1186/s12916-019-1373-y.
10. Prospective Diabetes Study Group. Efficacy of atenolol and captopril in reducing risk of macrovascular and microvascular complications in type II diabetes: UKPDS 39. *Br Med J*. 1998;317:713-20.
11. Reyes-Pardo H., Bautista R., Vargas-Robles H., et al. Role of sodium/glucose cotransporter inhibition on a rat model of angiotensin II-dependent kidney damage. *BMC Nephrol*. 2019;20(1):292. DOI:10.1186/s12882-019-1490-z.
12. Stamler J., Vaccaro O., Neaton J.D, Wentworth D., for the Multiple Risk Factor Intervention Trial Research Group. Diabetes, other risk factors, and 12year cardiovascular mortality for men screened inthe Multiple Risk Factor Intervention Trial. *Diabetes Care*. 1993;16:434-44. DOI:10.2337/diacare.16.2.434.

13. Tatyana Yulievna Demidova*, Oksana Andreevna Kislyak Features of the course and treatment of arterial hypertension in patients with type 2 diabetes mellitus Shestakova, M. V. // *Cardiology*, 1999; 6: 59–65.
14. Farrukh S. ORGANIZATION OF DIGITALIZED MEDICINE AND HEALTH ACADEMY AND ITS SIGNIFICANCE IN MEDICINE // *Science and innovation*. – 2023. – T. 2. – №. Special Issue 8. – C. 493-499.
15. U.K. Prospective Diabetes Study Group. Efficacy of atenolol and captopril in reducing risk of macrovascular and microvascular complications in type II diabetes: UKPDS 39. *Br Med J*. 1998;317:713-20.